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SPECIAL BULLETIN.

A MONOGRAPH

OF THE

SEAL-ISLANDS OF ALASKA.

BY

HENRY W. ELLIOTT.

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To the President,
with the homage of the author,
Henry W. Elliott.

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SECTION IX [MONOGRAPH A].

A MONOGRAPH OF THE PRIBYLOV GROUP,

OR THE

SEAL-ISLANDS OF ALASKA.

BY

HENRY W. ELLIOTT.

WITH TWENTY-NINE PLATES, TWO MAPS, AND TWELVE SKETCH-MAPS OF THE
ISLANDS AND THE ROOKERIES BY THE AUTHOR.

EXPLANATORY NOTES AND COMMENTS UPON THE MAP OF ST. GEORGE ISLAND.

ST. GEORGE.—This title was given to the island by its discoverer in honor of his vessel, the sloop "St. George".

SALIENT FEATURES OF THE TOPOGRAPHY: INACCESSIBLE CHARACTER OF THE COAST.—The profile which I give of this island presents clearly the idea of that characteristic, cold, abrupt elevation of St. George from the sea. From the Garden cove around to Zapadni beach, there is not a single natural opportunity for a man to land; then, again, from Zapadni beach round to Starry Atel there is not one sign of a chance for an agile man to come ashore and reach the plateau above. From Starry Atel to the Great Eastern rookery there is an alternation, between the several breeding-grounds, of three low and gradual slopes of the land to sea-level; these, with the landing at Garden cove and at Zapadni, are the only spots of the St. George coast where we can come ashore. An active person can scramble up at several steep places between the Sea Lion rookery and Tolstoi Mees, but the rest of that extended bluffy sea-wall, which I have just defined, is wholly inaccessible from the water. A narrow strip of rough, rocky shingle, washed over by every storm-beaten sea, is all that lies beneath the mural precipices.

PRETTY CASCADE AT WATERFALL HEAD.—In the spring, when the snow melts on the high plateau, a beautiful cascade is seen at Waterfall head; the feathery, filmy, silver ribbon of plunging water is thrown out into exquisite relief by the rich background of that brownish basalt and tufa over which it drops. Another pretty little waterfall is to be seen just west of the village, at this season only, where it leaps from a low range of bluffs to the sea; the first named cascade is more than 400 feet in sheer unbroken precipitation.

One or two small, naked, pinnacle rocks, standing close in, and almost joined to the beach at the Sea Lion rookery, constitute the only outlying islets or rocks; a stony kelp bed at Zapadni, and one off the Little Eastern rookery, both of limited reach seaward, are the only hinderances to a ship's sailing boldly round the island, even to scraping the bluffs, at places, safely with her yard-arms. I have located the Zapadni shoal by observation from the bluffs above; while Captain Baker, of the "Reliance", sounded out the other.

AUTHORITIES FOR LATITUDE AND LONGITUDE.—The observations which fix the positions of Tolstoi and Dalnoi Mees are taken from Russian authority (Captain Archimandritov), while the location of the village was made by Lieutenant Washburn Maynard and myself, in 1874, together with the degrees of variation to the compass; we used an artificial horizon; the overcast weather prevented our verification of the two other points given.

TREND OF OCEAN CURRENTS HERE.—Although small quantities of drift-wood lodge on all points of the coast, yet the greatest amount is found on the south shore, and thence around to Garden cove; this drift-timber is usually wholly stripped of its bark, principally pine and fir sticks, some of them quite large, 18 inches to 2 feet in diameter. Several years occur when a large driftage will be thrown or stranded here; then long intervals of many seasons will elapse with scarcely a log or stick coming ashore. I found at Garden cove, in June, 1873, the well preserved husk of a cocconut, cast up by the surf on the beach; did I not know that it was most undoubtedly thrown over by some whaler in these waters, not many hundred miles away at the farthest, I should have indulged in a pretty reverie over its path in drifting from the South seas to this lonely islet. I presume, however, that the timber, which the sea brings to the Pribylov islands, is that borne down upon the annual floods of the Kuskokvini and Nushagak rivers, on the mainland, and to the east-northeastward, a little more than 225 miles; it comes, however, in very scant supply. I saw very little drift-wood on St. Matthew island; but on the eastern shore of St. Lawrence there was an immense aggregate, which unquestionably came from the Yukon mouth.

SPOT OF PRIBYLOV'S LANDING.—One of the natives, "stareek", Zachar Oostigov ("the president"), told me that the "Russians, when they first landed, came ashore in a thick fog", at Tolstoi Mees, near the present Sea Lion rookery site. As the water is deep and bold there, Pribylov's sloop, the "St. George", must have fairly jammed her bowsprit against those lofty cliffs ere the patient crew had intimation of their position. The old Aleut then showed me the steep gully there, up which the ardent discoverers climbed to the plateau above; and to demonstrate that he was not chilled, or weakened by age, he nimbly scrambled down to the surf below, some 350 vertical feet, and I followed, half stepping and half sliding over Pribylov's path of glad discovery and proud possession, trodden one June day by him, nearly a hundred years ago.

SUGGESTIONS FOR BETTER LOADING AND DISCHARGING A CARGO.—With regard to the loading and unloading of the vessels at St. George, I believe that it would be wise and economical to grade a wagon-road over from the village to Garden cove; I think so because weeks and weeks consecutively have passed, to my personal knowledge, between the unloading and the loading of the steamer; when, during all that season of weary, anxious waiting for the surf to quiet down at the village landing, there was not a single day in which the ship could not have discharged or received her cargo easily and expeditiously on the sand beach at Garden cove. When the "St. Paul" has 75,000 seal-skins in her hold, taken on at the larger island, then has to pound "off and on" here, in fog and tempest, for a week or two, or even longer, waiting for a chance to get the 20,000 or 25,000 St. George skins (ready for her) in turn, her cargo is too costly to risk in this manner, inasmuch as the difficulty can be readily obviated by the cart-road I have indicated. The natives could and would hitch themselves into large hand-carts, and thus draw the skins across and supplies back, with the aid of a mule or two on the stiff grade; this would occur in ascending Ahlukkeyak ridge from the village, and also up a short one again rising from Garden cove to the mesa tops. The distance is only $2\frac{3}{4}$ to $3\frac{1}{4}$ miles, and 2 miles of that is nearly fit for wheels, as it lies to-day. I think, seriously, this should be done; it may save or prevent in the future the loss of a valuable ship and her priceless cargo of human life and all its belongings. Thick fogs and howling gales of wind, are dangerous and chronic here.

WHAT THE SKETCH-MAP SHOWS.—The sketch-map of Alaska, which I have inserted in the lower corner of this chart of St. George, is to show, better than any language can, the relative position of these celebrated seal-islands; and also to give a clear idea of their isolation and great distance from Sitka, where most of our people think all Alaska is centered. In fact, Sitka, as far as trade and resources and population are concerned, is one of the most insignificant spots known to that country. Kadiak, Oonga, Belcovskie, and Oonashka each have a greater civilized population than has Sitka to-day, and each has a hundred-fold more importance as a trade-center. As the ship sails, the Pribylov islands are:

2,250 miles W. N. W. from San Francisco.

1,500 miles W. N. W. from Vancouver island, straits of Fuca.

1,400 miles W. N. W. from Sitka.

550 miles W. N. W. from Kadiak.

192 miles W. N. W. from Oonashka.

700 miles E. N. E. from Commander islands, Russian territory.

All these distances are via Oonashka, save the last one.

EXPLANATORY NOTES AND COMMENTS UPON THE MAP OF ST. PAUL ISLAND.

ST. PAUL.—This name was given to the island because it was described for the first time on St. Paul's Day, July 10, 1787, by the Russian discoverers. [June 29, Justinian calendar.]

DEFINITIONS FOR RUSSIAN NAMES OF THE ROOKERIES, ETC.—The several titles on the map that indicate the several breeding-grounds, owe their origin and have their meaning as follows:

ZAPADNIE signifies "westward", and is so used by the people who live in the village.

ZOLSTOI signifies "golden", so used to express the metallic shimmering of the sands there.

KETAVIE signifies "of a whale", so used to designate that point where a large right whale was stranded in 1849 (?); from Russian "keet", or "whale".

LUKANNON.—So named after one Lukannon, a pioneer Russian, who distinguished himself, with one Kaiecov, a countryman, by capturing a large number of sea-otters at that point, and on Otter island, in 1787-'88.

TONKIE MEES signifies "small (or "slender") cape" [tonkie, "thin"; mees, "cape"].

POLAVINA literally signifies "half way", so used by the natives because it is practically half way between the salt-houses at Northeast Point and the village. POLAVINA SOPKA, or "half-way mountain", gets its name in the same manner.

NOVASTOSHNAH, from the Russian "novatie", or "of recent growth", so used because this locality in pioneer days was an island to itself; and it has been annexed recently to the main land of St. Paul.

VESOLIA MISTA, or "jolly place", the site of one of the first settlements, and where much carousing was indulged.

MARONITCHI, the site of a pioneer village, established by one Maroon.

NAHSATVERNIA, or "on the north shore", from Russian "sayvernie".

BOGA SLOV, or "word of God", indefinite in its application to the place, but is, perhaps, due to the fact that the pious Russians, immediately after landing at Zapadnie, in 1787, ascended the hill and erected a huge cross thereon.

EINAHNUHO, an Aleutian word, signifying the "three mammae".

TOLSTOI, a Russian name, signifying "thick"; it is given to at least a hundred different capes and headlands throughout Alaska, being applied as indiscriminately as we do the term "Bear creek" to little streams in the western states and territories.

THE PROFILE OF ST. PAUL.—That profile of the south shore, between the Village Hill and Southwest Point, taken from the steamer's anchorage off the Village cove, shows the characteristic and remarkable alternation of rookery slope and low sea-level flats. This point of viewing is slightly more than half a mile true west of the Village hill, to a sight which brings Boga Slov summits and Tolstoi head nearly in line. At Zapadnie is the place where the Russian discoverers first landed in 1787, July 10. With the exception of the bluff west end, Ein-ahnuh-to cliffs, the whole coast of St. Paul is accessible, and affords an easy landing, except at the short reach of "Seethah" and the rookery points, as indicated. The great sand beach of this island extends from Lukannon to Polavina, thence to Webster's house, Novastoshpah; from there over, and sweeping back and along the north shore to Nahsavernia headland, then between Zapadnie and Tolstoi, together with the beautiful though short sand of Zoltoi. This extensive and slightly broken sandy coast is not described as peculiar to any other island in Alaska, or of Siberian waters.

FRESH-WATER LAKES.—There are no running streams at any season of the year on St. Paul; but the abundance of fresh water is plainly presented by the numerous lakes, all of which are "avayjoi", save the lagoon estuary. The four large reefs which I have located are each awash in every storm that blows from seaward over them; they are all rough, rocky ledges. That little one indicated in English bay caused the wrecking of a large British vessel in 1847, which was coming in to anchor just without Zapadnie; a number of the crew were "maaslucken",* so my native informant averred.

DRIFT-WOOD.—Most of the small amount of drift-wood that is found on this island is procured at Northeast Point, and Polavina; the north shore from Maronitch to Tsammanah has also been favored with sea-waif logs in exceptional seasons, to the exclusion of all other sections of the coast. The natives say that the St. George people get much more drift-wood every year, as a rule, than they do on St. Paul. From what I could see during my four seasons of inspection, they never have got much, under the best of circumstances, on either island. They pay little attention to it now, and gather what they do during the winter season, going to Polavina and the north shore with sleds, on which they hoist sails after loading there, and send home before the strong northerly blasts.

Captain Erskine informs me that the water is free and bold all around the north shore, from Cross hill to Southwest Point; no reefs or shoals up to within a half a mile of land anywhere. English bay is very shallow, and no sea-going vessel should attempt to enter it, that draws over 6 feet.

AUTHORITIES FOR LATITUDE AND LONGITUDE.—All the positions of latitude and longitude which I place upon this map are taken from Captain Archimandritov's manuscript chart. During the whole month of July, 1874, while I was here with the "Reliance", there was not a single opportunity for a solar observation, although Captain Baker made several attempts to make some. Captain Erskine, however, has verified Archimandritov's work, and says that it is very near the correct thing. I could have taken observations easily in the occasional clear November days of 1872, but, unfortunately, the chronometer which I had, proved so defective that I abandoned the labor.

HOW TO REACH WALRUS ISLET.—To visit Walrus island in a boat, pleasantly and successfully, it is best to submit to the advice and direction of the natives. They leave the village in the evening, and, taking advantage of the tide, proceed along the coast as far as the bluffs of Polavina, where they rest on their oars, doze and smoke, until the dawning of daylight, or later, perhaps, until the fog lifts enough for them to get a glimpse of the islet which they seek; they row over then in about two hours with their bidarrah. They leave, however, with perfect indifference as to daylight or fog; nothing but a southeaster can disturb their tranquility when they succeed in landing on Walrus island. They would find it as difficult to miss striking the extended reach of St. Paul on their return, as they found it well nigh impossible to push off from Polavina and find "Morzovia" in a thick, windy fog and running sea.

OTTER ISLET: SLIGHT CORRECTION.—Otter island, or "Bobrovia", is easily reached in almost any weather that is not very stormy, for it looms up high above the water. It takes the bidarrah about two hours to row over from the village, while I have gone across once in a whale-boat with less than one hour's expenditure of time, sail and oars, *en route*. A slight mistake of the engraver causes Crater point to appear as a bifurcated tongue. It is not so; but there is a funnel-shaped cavity here plainly emarginated from the sea, and on that extreme point, constituting and giving to it this name.

*Anything missing, or beyond human ken, in the Aleutian vernacular is "maaslucken".

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THE SEAL ISLANDS OF ALASKA.

A. INTRODUCTION.

1. HISTORY AND OBJECTS OF THE MEMOIR.

THE WRITER'S OPPORTUNITIES FOR OBSERVATION.—During the progress of the heated controversies that took place during the negotiations which ended in the acquisition of Alaska by our government, frequent references were made to the fur-seal. Strange to say, this animal was so vaguely known at that time, even to scientific men, that it was almost without representation in any of the best zoölogical collections of the world: even the Smithsonian Institution did not possess a perfect skin and skeleton. The writer, then as now, an associate and collaborator of this establishment, had his curiosity very much excited by those stories, and in March, 1872, he was, by the joint action of Professor Baird and the Secretary of the Treasury, enabled to visit the Pribylov islands for the purpose of studying the life and habits of these animals.

The fact is, that the acquisition of those pelagic peltries had engaged thousands of men, and that millions of dollars have been employed in capturing, dressing, and selling fur-seal skins during the hundred years just passed by; yet, from the time of Steller, away back as far as 1751, up to the beginning of the last decade, the scientific world actually knew nothing definite in regard to the life-history of this valuable animal. The truth connected with the life of the fur-seal, as it herds in countless myriads on the Pribylov islands of Alaska, is far stranger than fiction. Perhaps the existing ignorance has been caused by confounding the hair-seal, *Phoca vitulina*, and its kind, with the creature now under discussion. Two animals more dissimilar in their individuality and method of living can, however, hardly be imagined, although they belong to the same group, and live apparently upon the same food.

The notes, surveys, and hypotheses herewith presented are founded upon the writer's personal observations in the seal-rookeries of St. Paul and St. George, during the seasons of 1872 to 1874, inclusive, supplemented by his confirmatory inspection made in 1876. They were obtained through long days and nights of consecutive observation, from the beginning to the close of each seal-season, and cover, by actual surveys, the entire ground occupied by these animals. They have slumbered in the author's portfolio until the present moment, simply for the reason that he desired, before making a final presentation of the history of these islands and the life thereon, to visit the Russian seal-islands, the "Commanders", viz, Bering and Copper islands, which lie to the westward, 700 miles from our own, and are within the pale of the czar's dominion.

PREVIOUS OBSERVATIONS OF STELLER AND OTHERS.—In treating this subject the writer has trusted to nothing save what he himself has seen; for, until these life-studies were made by him, no succinct and consecutive history of the lives and movements of these animals had been published by any man. Fanciful yarns, woven by the ingenuity of whaling captains, in which the truth was easily blended with that which was not true, and short paragraphs penned hastily by naturalists of more or less repute, formed the knowledge that we had. Best of all was the old diary of Steller, who, while suffering bodily tortures, the legacy of gangrene and scurvy, when wrecked with Vitus Bering on the Commander islands, showed the nerve, the interest, and the energy of a true naturalist. He daily crept, with aching bones and watery eyes, over the boulders and mossy flats of Bering island, to catch glimpses of those strange animals which abode there then as they abide to-day. Considering the physical difficulties that environed Steller, the notes made by him on the sea-bears of the North Pacific are remarkably good; but, as I have said, they fail so far from giving a fair and adequate idea of what these immense herds are and do, as to be absolutely valueless for the present hour. Shortly after Steller's time, great activity sprang up in the South Atlantic and Pacific over the capture and sale of fur-seal skins taken in those localities. It is extraordinary, that though whole fleets of American, English, French, Dutch, and Portuguese vessels engaged, during a period of protracted enterprise, of over eighty years in length, in the business of repairing to the numerous rookeries of the Antarctic, returning

annually, laden with enormous cargoes of fur-seal skins; yet, as above mentioned, hardly a definite line of record has been made in regard to the whole transaction, involving, as it did, so much labor and so much capital.

FORMER PUBLICATIONS OF THE WRITER.—A brief digest of the writer's notes, relating principally to the business on the islands, was prepared and given to the Treasury Department in 1873-'74. This was printed by the Secretary, and has been the text of guidance, as to observation, employed by the agents of the government ever since. The maps and sketch-maps are herewith accordingly given to the public for the first time; the author, fearing that private and personal affairs, which now confine him, may possibly never permit his going over to the Asiatic rookeries, thinks it perhaps better that what he now knows definitely in regard to the matter should be published without longer delay.

It was with peculiar pleasure that the writer undertook, at the suggestion of Professor Baird, who is the honored and beloved secretary of the Smithsonian Institution, the task of examining into and reporting upon this subject; and it is also gratifying to add, that the statements of fact and the hypotheses evolved therefrom by him in 1874, have, up to the present time, been verified by the inflexible sequence of events on the ground itself. The concurrent testimony of the numerous agents of the Treasury Department and the government generally, who have trodden in his footsteps, amply testifies to their stability. (See note, 39, A.)

B. GEOGRAPHICAL DISTRIBUTION.

2. GEOGRAPHICAL DISTRIBUTION OF THE FUR-SEAL.

PECULIARITIES OF DISTRIBUTION.—Our first thought in studying the distribution of the fur-seals throughout the high seas of the earth, is one of wonder. While they are so widely spread over the Antarctic regions, yet, as we pass the equator going north, we find in the Atlantic above the tropics nothing that resembles them. Their range in the North Pacific is virtually confined to four islands in Bering sea, namely, St. Paul and St. George of the tiny Pribylov group, and Bering and Copper of the Commander islands, large in area, but relatively scant in seal-life.

The remarkable discrepancy which we have alluded to may be better understood when we consider that these animals require certain conditions of landing and breeding ground and climate, all combined, for their perfect life and reproduction. In the North Atlantic no suitable territory for their reception exists, or ever did exist; and really nothing in the North Pacific beyond what we have designated in Bering sea will answer the requirements of the fur-seal. When we look over the Antarctic waters, we are surprised at what might have been done, and should have been done, in those southern oceans. There we find hundreds of miles of the finest seal-breeding grounds on the western coast of Patagonia, the beautiful reaches of the Falkland islands, the great extent of Desolation island, together with the whole host of smaller islets, where these animals abounded in almost countless numbers when first discovered, and should abound to-day—millions upon millions—but which have been, through nearly a century the victims of indiscriminate slaughter, directed by most unscrupulous and most energetic men. It seems well-nigh incredible, but it is true, nevertheless, that for more than fifty years a large fleet, numbering more than sixty sail, and carrying thousands of active men, traversed this coast and circumnavigated every island and islet, annually slaughtering right and left wherever the seal-life was found. Ships were laden to the water's edge with the fresh, air-dried, and salted skins, and they were swallowed up in the marts of the world, bringing mere nominal prices—the markets glutted, but the butchery never stopping.

THE SEAL-GROUNDS IN THE SOUTHERN HEMISPHERE.—I will pass in brief review the seal-grounds of the southern hemisphere. The Galapagos islands come first in our purview; this scattered group of small rocks and islets, uninhabited and entirely arid, was, fifty years ago, resorted to by a very considerable number of these animals, *Arctocephalus australis*, together with many sea-lions, *Otaria Hookeri*; great numbers were then captured by fur-sealers, who found to their sorrow, when the skins were inspected, that pelage was poor and worthless. A few survivors, however, remain to this day.

Along and off the coast of Chili and Bolivia are the St. Felix and Juan Fernandez islands, the latter place being one of the most celebrated rookeries known to Antarctic sealers. The west coast of Patagonia and a portion of that of Terra del Fuego was, in those early days of seal-hunting, and is to-day, the finest connected range of seal-rookery ground in the south. Here was annually made the concentrated attack of that sealing fleet referred to; and one can readily understand how thorough must have been the labor, as he studies the great extent and deep indentation of this coast, its thousand and one islands and islets, and when he sees to-day that there is scarcely a rookery of fur-seals known to exist there. The Falkland islands, just abreast of the straits of Magellan, were also celebrated, and a favorite resort, not only of the sealers, but of the whale-fleets of the world. They are recorded, in the brief mention made by the best authority, as fairly swarming with fur-seals when they were opened up by Captain Cook. There is to-day, in the place of the millions that once existed, an insignificant number, taken notice of only now and then.

The Georgia islands and the Sandwich group, all a succession of rocky islands and reefs awash—the South Ockneys, the Shetlands, the Auckland group, Campbell's island, Emerald island, and a few islets lying just to the southward of New Zealand—have all been places of lively and continued butchery; the fur-seals ranging in desperation from one of those places to the other as the seasons progressed, and the merciless search and slaughter continued. These pinnipeds, however, never went to the southward of 62° south latitude.

In considering the western Antarctic hemisphere, I must not forget also to mention, that the fur-seal was in early times found up the east coast of South America, here and there in little rookeries, as far north as cape St. Roque; but the number was unimportant, when brought into contrast with that belonging to those localities which I have designated. A small cliff-bound rookery to-day exists at cape Corientes. This is owned and farmed out by the Argentine republic, and we are informed that in spite of all their care and attention they have neither increased nor have they diminished from their original insignificance; from this rookery only three to five thousand were and are annually taken. It appears as if the fur-seals had originally passed to Bering sea from the parent stock of the Patagonia region, up along the coast of South America, a few tarrying at the dry and heated Galapagos islands, the rest speeding on to the northward, disturbed by the clear skies and sandy beaches of the Mexican coast, on and up to the great fish-spawning shores of the Aleutian islands and Bering sea. There, on the Pribylov group and the bluff Commander islands, they found that union of cool water, well-adapted landing, and moist, foggy air which they had missed since they left the storm-beaten coasts far below.

In the Antarctic waters of the eastern hemisphere seals were found at Tristan da Cunha, principally on Little Nightingale island, to the southward of it; on Gough's island; on Bouvet's island; Prince Edward and Marion islands; the Crozette group, all small rocks, as it were, over which violent storms fairly swept; then we observe the great rookeries of Kerguelen land, or Desolation island—where perhaps nine-tenths of all the oriental fur-seals congregated—thence over to a small and insignificant islet known as the Royal Company, south of Good Hope. This list includes all the known resting-places of the fur-seal in those waters.

FORMER ABUNDANCE IN THE SOUTHERN HEMISPHERE: EXTENT OF EXTERMINATIONS.—In the light of the foregoing remarks, is it not natural, when we reflect upon the immense area and the exceedingly favored conditions of ground and climate frequented by the fur-seals of the Southern ocean, to say that their number must have been infinitely greater as they were first apprehended, surpassing all adequate description, when compared to those which we now regard as the marvel and wonder of the age—the breeding rookeries of the Pribylov group?

It is a great pity that this work of extermination and senseless destruction should have progressed as it has to the very verge of total extinction, ere any one was qualified to take note of and record the wonderful life thus eliminated. The Falkland islands and Kerguelen land, at least, might have been placed under the same restrictions and wholesome direction which the Russians established in the North seas, the benefits of which accrue to us to-day, and will forever, as matters are now conducted. Certainly it is surprising that the business thought, the hardheaded sense, of those early English navigators, should not have been equal to that of the Russian *Promyshleniks*, who were renowned as the most unscrupulous and the greediest of gain-getters.

POSSIBILITIES FOR PROTECTION.—The Falkland islands offer natural conditions of protection by land far superior to those found on the Pribylov or Commander groups. They have beautiful harbors, and they lie in the track of commerce, advantages which are not shared by our islands; at Desolation island, perhaps, the difficulties are insuperable on account of the great extent of coast, which is practically inaccessible to men and nearly so to the seals; but the Falkland islands might have been farmed out by the British government at a trifling outlay and with exceeding good result; for, millions upon millions of the fur-seals could rest there to-day, as they did a hundred years ago, and be there to-morrow, as our seals do and are in Bering sea. But the work is done. There is nothing down there, now, valuable enough to rouse the interest of any government; still, a beginning might be made, which possibly forty or fifty years hence would rehabilitate the scourged and desolated breeding-grounds of the South seas. We are selfish people, however, and look only to the present, and it is, without question, more than likely that should any such proposition be brought before the British parliament it would be so ridiculed and exaggerated by demagogues and ignorant jesters as to cause its speedy suppression; hence, in our opinion, it is not at all likely that the English government, or any of the other governments controlling these many islands of the Southern ocean, which we have named, will ever take a single step in the right direction, as far as the encouragement of the fur-seal to live and prosper in those regions is concerned. When we look at our northern waters we speedily recognize the fact, that between North America and Europe, across the Atlantic and into the Arctic, there is not a single island or islet or stretch of coast that the fur-seal could successfully struggle for existence on. These facts will become entirely clear when the chapter on the habit of this animal is reached.

ISOLATION OF THE NORTH PACIFIC ROOKERIES.—In the North Pacific, in prehistoric times, a legend from Spanish authority states, that fur-seals were tolerably abundant on the Santa Barbara and Guadalupe islands, off the coast of California, and the peninsula to the southward. A few were annually taken from these islands, up to 1835 and some were wont to sport on those celebrated rocks off the harbor of San Francisco, known as the *Farralones*; but no tradition locates a seal-rookery anywhere else on the northwest coast, or anywhere else in all Alaska and its islands, save the Pribylov group: while across and down the Asiatic coast, only the Commander islands and a little

rock* in the Kurile chain have been and are resorted to by them. The crafty savages of that entire region, the hairy *Ainos* of Japan, and the Japanese themselves, have for a hundred years searched and searched in vain for such ground.

COMMERCIAL IMPORTANCE OF THE ALASKA ROOKERIES.—To recapitulate, with the exception of these seal-islands of Bering sea, there are none elsewhere in the world of the slightest importance to-day; the vast breeding-grounds bordering on the Antarctic have been, by the united efforts of all nationalities—misguided, short-sighted, and greedy of gain—entirely depopulated; only a few thousand unhappy stragglers are now to be seen throughout all that southern area, where millions once were found, and a small rookery protected and fostered by the government of a South American state, north and south of the mouth of the Río de la Plata. When, therefore, we note the eagerness with which our civilization calls for sealskin fur, the fact that, in spite of fashion and its caprices, this fur is and always will be an article of intrinsic value and in demand, the thought at once occurs, that the government is exceedingly fortunate in having this great amphibious stock-yard far up and away in the quiet seclusion of Bering sea, from which it shall draw an everlasting revenue, and on which its wise regulations and its firm hand can continue the seals forever.

C. THE PRIBYLOV ISLANDS.

3. DISCOVERY OF THE PRIBYLOV ISLANDS.

SEARCH OF RUSSIAN EXPLORERS FOR SEA-OTTERS AND SEALS.—All writers on the subject of Alaskan exploration and discovery, agree as to the cause of the discovery of the Pribylov islands in the last century. It was due to the feverish anxiety of a handful of Russian fur-gatherers, who desired to find new fields of gain when they had exhausted those last uncovered. Altasov, and his band of Russians, Tartars, and Kossacks, arrived at Kamchatka, toward the close of the seventeenth century, and they first found of all men, the beautiful, costly, rare fur of the sea-otter. The animal bearing this pelage abounded then on that coast, but by the middle of the eighteenth century they and those who came after them had entirely extirpated it from that country. Then the survivors of Bering's second voyage of observation, in 1741-'42, and Tschirikov brought back an enormous number of skins from Bering island; then Michael Novodiskov discovered Attou, and the contiguous islands, in 1745; Paikov came after him and opened out the Fox islands, in the same chain, during 1759; then succeeded Stepan Glotov, of infamous memory, who determined Kakiak in 1763, and the peninsula of Alaska followed in order by Kreutsin, 1768. During these long years, from the discovery of Attou until the last date mentioned above, a great many Russian associations fitted out at the mouth of the Amoor river, in the Okotsk sea, and prospected therefrom this whole Aleutian archipelago in search of the sea-otter. There were perhaps twenty-five or thirty different companies, with quite a fleet of small vessels, and so energetic and thorough were they in their search and capture of the sea-otter, that along by 1772 and 1774 the catch in this group had dwindled down from thousands and tens of thousands at first, to hundreds and tens of hundreds at last. As all men do when they find that that which they are engaged in is failing them, a change of search and inquiry was in order, and then the fur-seal, which had been noted but not valued much, every year as it went north in the spring through the passes and channels of the Aleutian chain, then going back south again in the fall, became the source of much speculation as to where it spent its time on land and how it bred. Nobody had ever heard of its stopping one solitary hour on a single rock or beach throughout all Alaska or the northwest coast. The natives, when questioned, expressed themselves as entirely ignorant, though they believed, as they believe in many things of which they have no knowledge, that these seals repaired to some unknown land in the north every summer and left every winter. They also reasoned then, that when they left the unknown land to the north in the fall, and went south into the North Pacific, they traveled to some other strange island or continent there, upon which in turn to spend the winter. Naturally the Russians preferred to look for the supposed winter resting-places of the fur-seal, and forthwith a hundred schooners and shallops sailed into storm and fog to the northward occasionally, but generally to the southward, in search of this rumored breeding-ground. Indeed, if the record can be credited, the whole bent of this Russian attention and search for the fur-seal islands was devoted to that region south of the Aleutian islands, between Japan and Oregon.

PRIBYLOV'S DISCOVERY OF THE ISLANDS WHICH BEAR HIS NAME.—Hence it was not until 1786, after more than eighteen years of unremitting search by hardy navigators, that the Pribylov islands were discovered. It seems that a rugged Muscovitic "stoorman", or ship's "mate", Gehrman Pribylov by name, serving under the direction and in the pay of one of the many companies engaged in the fur-business at that time, was much moved and exercised in his mind by the revelations of an old Aleutian shaman at Oonalashka, who pretended to recite a legend of the natives, wherein he declared that certain islands in the Bering sea had long been known to Aleuts.†

Pribylov commanded a small sloop, the "St. George", which he employed for three successive years in constant, though fruitless, explorations to the northward of Oonalashka and Oniniak, ranging over the whole of

* Robbins reef.

† This legend is translated by the author, and published in the Appendix.

Bering sea from the straits above. His ill-success does not now seem strange, when we understand the currents, the winds, and fogs of those waters. Why, only recently the writer himself has been on one of the best-manned vessels that ever sailed from any port, provided with good charts and equipped with all the marine machinery known to navigation, and that vessel has hovered for nine successive days off the north point and around St. Paul island, sometimes almost on the reef, and never more than ten miles away, without actually knowing where the island was! So Pribylov did well, considering, when at the beginning of the third summer's tedious search, in June, 1786, his old sloop ran up against the walls of Tolstoi Mees, at St. George, and when, though the fog was so thick that he could see scarce the length of his vessel, his ears were regaled by the sweet music of seal-rookeries wafted out to him on the heavy air. He knew then that he had found the object of his search, and he at once took possession of the island in the Russian name and that of his craft.

His secret could not long be kept. He had left some of his men behind him to hold the island, and when he returned to Oonalashka they were gone. And, when the next season had fairly opened, a dozen vessels were watching him and tripping in his wake. Of course they all found the island, and in that year, July, 1787, the sailors of Pribylov, on St. George, while climbing the bluffs and straining their eyes for a relief-ship, descried the low coast and scattered cones of St. Paul, thirty-six miles to the northwest of them. When they landed at St. George, not a sign nor a vestige of human habitation was found thereon; but during the succeeding year, when they crossed over to St. Paul, and took possession of it, in turn, they were surprised at finding on the south coast of that island, at a point now known as English bay, the remains of a recent fire. There were charred embers of driftwood, and places where grass had been scorched; there was a pipe, and a brass knife handle, which I regret to say have long passed beyond the cognizance of any ethnologist. This much appears in the Russian records.

4. DESCRIPTION OF THE PRIBYLOV ISLANDS.

The Pribylov islands lie in the heart of Bering sea, and are among the most insignificant landmarks known in that ocean. They are situated 192 miles north of Oonalashka, 200 miles south of St. Matthews, and about the same distance westward of cape Newenham on the mainland.

CLIMATE.—The islands of St. George and St. Paul are from twenty-seven to thirty miles apart, St. George lying southeastward of St. Paul. They are far enough south to be beyond the reach of permanent ice-floes, upon which polar bears could have made their way to the islands, though a few of these animals were, doubtless, always present. They laid also distant enough from the inhabited Aleutian districts and the coast of the mainland to have remained unknown to savage men. Hence they afforded the fur-seal the happiest shelter and isolation, for their position seems to be such as to surround and envelop them with fog-banks that fairly shut out the sun nine days in every ten, during the summer and breeding-season.

In this location, ocean-currents from the great Pacific, warmer than the normal temperature of that latitude, trending up from southward, ebb and flow around the islands as they pass, giving rise, during the summer and early autumn, to constant, dense, humid fog and drizzling mists, which hang in heavy banks over the islands and the sea-line, seldom dissolving away to indicate a pleasant day. By the middle or end of October, strong, cold winds, refrigerated on the Siberian steppes, sweep down across the islands, carrying off the moisture and clearing up the air. By the end of January, or early in February, they usually bring, by their steady pressure, from the north and northwest, great fields of broken ice, sludgy floes, with nothing in them approximating or approaching glacial ice. They are not very heavy or thick, but still as the wind blows they compactly cover the whole surface of the sea, completely shutting in the land, and for months at a time hushing the wonted roar of the surf. In the exceptionally cold seasons that succeed each other up there every four or five years, for periods of three and even four months—from December to May, and sometimes into June—the islands will be completely environed and ice-bound. On the other hand, in about the same rotation, occur the exceptionally mild winters. Not even the sight of an ice-floe is recorded during the whole winter, and there is very little skating on the shallow lakes and lagoons peculiar to St. Paul and St. George. This, however, is not often the case.

The breaking-up of winter-weather and the precipitation of summer (for there is no real spring or autumn in these latitudes), usually commences about the first week in April. The ice begins to leave or dissolve at that time, or a little later, so that by the 1st or 5th of May, the beaches and rocky sea-margin beneath the mural precipices are generally clear and free from ice and snow, although the latter occasionally lies until the end of July or the middle of August, in gullies and on leeward hill-slopes, where it has drifted during the winter. Fog, thick and heavy, rolls up from the sea, and closes over the land about the end of May; this, the habitual sign of summer, holds on steadily to the middle or end of October again.

The periods of change in climate are exceedingly irregular during the autumn and spring, so-called, but in summer the cool, moist, shady, gray fog is constantly present. To this certainty of favored climate, coupled with the perfect isolation and the exceeding fitness of the ground, is due without doubt, that preference manifested by the warm-blooded animals which come here every year, in thousands and hundreds of thousands, to breed, to the practical exclusion of all other ground.

A large amount of information in regard to the climate of these islands has been collected and recorded by the signal service, United States army, and similar observations are still continued by the agents of the Alaska Commercial Company. I simply remark here, that the winter which I passed upon St. Paul island (1872-73) was one of great severity, and, according to the natives, such as is very seldom experienced. Cold as it was, however, the lowest marking of the thermometer was only 12° Fahr. below zero, and that lasted but a few hours during a single day in February, while the mean of that month was 18° above. I found that March was the coldest month. Then the mean was 12° above, and I have since learned that March continues to be the meanest month of the year. The lowest average of a usual winter ranges from 22° to 26° above zero; but these quiet figures are simply inadequate to impress the reader with the exceeding discomfort of the winter in that locality. It is the wind that tortures and cripples out-door exercise there, as it does on all the sea-coast and islands of Alaska. It is blowing, blowing, from every point of the compass at all times; it is an everlasting succession of furious gales, laden with snow and sleety spiculae, whirling in great drifts to-day, while to-morrow the "boerga" will blow from a quarter directly opposite, and reverse its rift-building of the day preceeding.

Without being cold enough to suffer, one is literally confined and chained to his room from December until April by this æolian tension. I remember very well that, during the winter of 1872-73, I was watching, with all the impatience which a man in full health and tired of confinement can possess, every opportunity to seize upon quiet intervals between the storms, in which I could make short trips along the tracks over which I was habituated to walk during the summer; yet, in all that hyemal season I got out but three times; and then only by the exertion of great physical energy. On a day in March, for example, the velocity of the wind at St. Paul, recorded by one of the signal service anemometers, was at the rate of 88 miles per hour, with as low a temperature as -4° ! This particular wind-storm, with snow, blew at such a velocity for six days without an hour's cessation, while the natives passed from house to house crawling on all-fours: no man could stand up against it, and no man wanted to. At a much higher temperature—say at 15° or 16° above zero—with the wind blowing only 20 or 25 miles an hour, it is necessary, when journeying, to be most thoroughly wrapped up, to guard against freezing.

As I have said, there are here virtually but two seasons—winter and summer. To the former belongs November and the following months up to the end of April, with a mean temperature of 20° to 28° ; while the transition of summer is but a very slight elevation of that temperature, not more than 15° or 20° . Of the summer months, July, perhaps, is the warmest, with an average temperature between 46° and 50° in ordinary seasons. When the sun breaks out through the fog, and bathes the dripping, water-soaked hills and flats of the island in its hot flood of light, I have known the thermometer to rise to 60° and 64° in the shade, while the natives crawled out of the fervent and unwonted heat, anathematizing its brilliancy and potency. Sunshine does them no good; for, like the seals, they seem under its influence to swell up at the neck. A little of it suffices handsomely for both Aleuts and pinnipedia, to whom the ordinary atmosphere is much more agreeable.

It is astonishing how rapidly snow melts here. This is due, probably, to the saline character of the air, for when the temperature is only a single degree above freezing, and after several successive days in April or May, at 34° and 36° , grass begins to grow, even if it be below melting drifts, and the frost has penetrated the ground many feet beneath. I have said that this humidity and fog, so strongly and peculiarly characteristic of the Pribylov group, was due to the warmer ocean-currents setting up from the coast of Japan, and trending to the Arctic through Bering's straits, and deflected to the southward into the North Pacific, laving, as it flows, the numerous passes and channels of the great Aleutian chain; but I do not think, nor do I wish to be understood as saying, that my observation in this respect warrants any conclusion as to so large a gulf-stream flowing to the north, such as mariners and hydrographers recognize upon the Atlantic coast. I do not believe that there is anything of the kind equal to it in Bering sea. I think, however, that there is a steady set-up to northward from southward around the seal-islands, which is continued through Bering's straits, and drifts steadily off up to the northeast, until it is lost beyond Point Barrow. That this pelagic circulation exists, is clearly proven by the logs of the whalers, who, from 1845 to 1856, literally filled the air over those waters with the smoke of their "try-fires", and plowed every square rod of that superficial marine area with their adventurous keels. While no two, perhaps, of those old whaling captains living to-day, will agree as to the exact course of tides,* for Alaskan tides do not seem to obey any law, they all affirm the existence of a steady current, passing up from the south to the northeast, through Bering's straits. The flow is not rapid, and is doubtless checked at times, for short intervals, by other causes, which need not be discussed here. It is certain, however, that there is warm water enough, abnormal to the latitude, for the evolution of the characteristic fog-banks, which almost discomfited Pribylov, at the time of his discovery of the islands, nearly one hundred years ago, and which have remained ever since.

Without this fog the fur-seal would never have rested there as he has done; but when he came on his voyage of discovery, ages ago, up from the rocky coasts of Patagonia, mayhap, had he not found this cool, moist temperature of St. Paul and St. George, he would have kept on, completed the circuit, and returned to those congenial antipodes of his birth.

* The rise and fall of tide at the seal-islands I carefully watched one whole season at St. Paul. The irregularity, however, of ebb and flow, is the most prominent feature of the matter. The highest rise in the spring tides was a trifle over four feet, while that of the neap tides not much over two. Owing to the nature of the case, it is impossible to prepare a tidal calendar for Alaska, above the Aleutian islands, which will even faintly foreshadow a correct registration in advance.

CLOUDS.—Speaking of the stormy weather brings to my mind the beautiful, varied, and impressive nephelological display in the heavens overhead here during October and November. I may say, without exaggeration, that the cloud effects which I have witnessed from the bluffs of this little island, in those seasons of the year, surpass anything that I had ever seen before. Perhaps the mighty masses of cumuli, deriving their origin from warm exhalations out of the sea, and swelled and whirled with such rapidity, in spite of their appearance of solidity, across the horizon, owe their striking brilliancy of color and prismatic tones to that low declination of the sun due to the latitude. Whatever the cause may be, and this is not the place to discuss it, certainly no other spot on earth can boast of a more striking and brilliant cloud display. In the season of 1865-'66, when I was encamped on this same parallel of latitude in the mountains eastward of Sitka and the interior, I was particularly attracted by the exceeding brilliancy, persistency, and activity of the aurora; but here on St. Paul, though I eagerly looked for its dancing light, it seldom appeared; and when it did, it was a sad disappointment, the exhibition always being insignificant when compared in my mind with that flashing of my previous experience. A quaint old writer,* a hundred years ago, when describing Norway and its people, called attention to what he considered a very plausible theory as to the cause of the aurora; he cited an ancient sage, who believed that the change of the winds threw the saline particles of the sea high into the air, and then, by aerial friction, "fermentation" took place, and the light was evolved! I am sure that the saline particles of Bering sea were whirled into the air during the whole of that winter of my residence there, but no "fermentation" occurred, evidently, for rarely indeed did the aurora greet my eyes. In the summer season there is considerable lightning; you will see it streak its zigzag path mornings, evenings, and even noondays, but from the dark clouds and their swelling masses upon which it is portrayed no sound returns; a *fulgur brutum*, in fact. I remember hearing but one clap of thunder while in that country. If I recollect aright, and my Russian served me well, one of the old natives told me that it was no mystery, this light of the aurora, for, said he, "we all believe that there are fire-mountains away up toward the north, and what we see comes from their burning throats, mirrored back on the heavens".

GEOLOGICAL STRUCTURE.—The formation of these islands, St. Paul and St. George, was recent, geologically speaking, and directly due to volcanic agency, which lifted them abruptly, though gradually, from the sea-bed. Little spouting craters then actively poured out cinders and other volcanic breccia upon the table-bed of basalt, depositing below as well as above the water's level as they rose; and subsequently finishing their work of construction through the agency of these spout-holes or craters, from which water-puddled ashes and tufa were thrown. Soon after the elevation and deposit of the igneous matter, all active volcanic action must have ceased, though a few half-smothered outbursts seem to have occurred very recently indeed; for on Bobrovia or Otter island, six miles southward of St. Paul, is the fresh, clearly blown-out throat, with the fire-scorched and smoked, smooth, sharp-cut, funnel-like walls of a crater. This is the only place on the seal-islands where there are any evidences of recent discharges from the crater of a volcano.

Since the period of the upheaval of the group under discussion, the sea has done much to modify and even enlarge the most important one, St. Paul, while the others, St. George and Otter, being lifted abruptly above the power of water and ice to carry and deposit sand, soil, and bowlders, are but little changed from the condition of their first appearance.

VEGETATION.—The Russians tell a rather strange story in connection with Pribylov's landing. They say that both the islands were at first without vegetation†, save St. Paul, where there was a small "talneek", or willow, creeping along on the ground; and that on St. George nothing grew, not even grass, except on the place where the carcasses of dead animals rotted. Then, in the course of time, both islands became covered with grass, a great part of it being of the sedge kind, *Elymus*. This record of Veniaminov, however, is scarcely credible; there are few, surely, who will not question the opinion that the seals antedated the vegetation, for, according to his own statements, those creatures were there then in the same immense numbers that we find them to-day. The vegetation on these islands, such as it is, is fresh and luxuriant during the growing season of June and July and early August, but the beauty and economic value of trees and shrubbery, of cereals and vegetables, is denied to them by climatic conditions. Still I am strongly inclined to believe that, should some of those hardy shrubs and spruce trees indigenous at Sitka or Kadiak, be transplanted properly to any of the southern hill-slopes of St. Paul most favored by soil, drainage, and bluffs for shelter from saline gales, they might grow, though I know that, owing to the lack of sunlight, they would never mature their seed. There is, however, during the summer, a beautiful spread of grasses, of flowering annuals, biennials, and perennials, of gaily-colored lichens and crinkled mosses‡, which have always afforded me great delight whenever I have pressed my way over the moors and up the hillsides of the rookeries.

There are ten or twelve species of grasses of every variety, from close, curly, compact mats to tall stalks—tussocks of the wild wheat, *Elymus arenaria*, standing in favorable seasons waist high—the "wheat of the north"—together with over one hundred varieties of annuals, perennials, spagnum, cryptogamic plants, etc., all flourishing in their respective positions, and covering nearly every point of rock, tufa, cement, and sand that a plant can grow

* Pontoppidan.

† Veniaminov: Zapieskie Oonashkenskaho Otdaya, etc., 1842.

‡ The mosses at Kamminista, St. Paul, are the finest examples of their kind on the islands; they are very perfect and beautiful in many species.

upon, with a living coat of the greenest of all greens—for there is not sunlight enough there to ripen any perceptible tinge of ochre-yellow into it—so green that it gives a deep blue tint to gray noonday shadows, contrasting pleasantly with the varying russets, reds, lemon-yellows, and grays of the lichen-covered rocks, and the brownish purple of the wild wheat on the sand-dune tracts in autumn, together, also, with innumerable blue, yellow, pink, and white phenogamous blossoms, everywhere interspersed over the grassy uplands and sandy flats. Occasionally, on looking into the thickest masses of verdure, our common wild violet will be found, while the phloxes are especially bright and brilliant here. The flowers of one species of gentian, *Gentiana verna*, are very marked in their beauty; also those of a nasturtium, and a creeping pea-vine on the sand-dunes. The blossom of one species of the pulse family is the only one here that emits a positive, rich perfume; all the others are more suggestive of that quality than expressive. The most striking plant in all the long list is the *Archangelica officinalis*, with its tall seed-stalks and broad leaves, which grows first in spring and keeps green latest in the fall. The luxuriant rhubarb-like stems of this umbellifer, after they have made their rapid growth in June, are eagerly sought for by the natives, who pull them and crunch them between their teeth with all the relish that we experience in eating celery. The exhibition of ferns at Kamminista, St. Paul, during the summer of 1872, surpassed anything that I ever saw: I recall with vivid detail the exceedingly fine display made by these crenulated and waving fronds, as they reared themselves above the rough interstices of the rocky ridges. From the fern roots, and those of the gentian, the natives here draw their entire stock of vegetable medicines. This floral display on St. Paul is very much more extensive and conspicuous than that on St. George, owing to the absence of any noteworthy extent of warm sand-dune country on the latter island.

When an unusually warm summer passes over the Pribylov group, followed by an open fall and a mild winter, the Elymus ripens its seed, and stands like fields of uncut grain, in many places along the north shore of St. Paul and around the village, the snow not falling enough to entirely obliterate it; but it is seldom allowed to flourish to that extent. By the end of August and the first week of September of normal seasons, the small edible berries of *Empetrum nigrum* and *Rubus chamaemorus* are ripe. They are found in considerable quantities, especially at "Zapadni", on both islands, and, as everywhere else throughout the circumpolar latitudes, the former is small, watery, and dark, about the size of the English or black currant; the other resembles an unripe and partially decayed raspberry. They are, however, keenly relished by the natives, and even by the American residents, being the only fruit growing upon the islands.

AGRICULTURE AND ITS POSSIBILITIES.—A great many attempts have been made, both here and at St. George, to raise a few of the hardy vegetables. With the exception of growing lettuce, turnips, and radishes on the island of St. Paul, nothing has been or can be done. On St. George, on the south shore, and at the foot of a mural bluff, is a little patch of ground of less than one-sixteenth of an acre, that appears to be so drained and so warmed by the rarely-reflected sunlight from this cliff, every ray of which seems to be gathered and radiated from the rocks, as to allow the production of fair turnips; and at one season there were actually raised potatoes as large as walnuts. Gardening, however, on either island involves so much labor and so much care, with so poor a return, that it has been discontinued. It is a great deal better, and a great deal easier, to have the "truck" come up once a year from San Francisco on the steamer.

INSECTS.—There is one comfort which nature has vouchsafed to civilized man on these islands. There are very few indigenous insects. A large flesh-fly, *Bombylius major*, appears during the summer and settles in a striking manner upon the backs of the loafing natives, or strings itself in rows of millions upon the long grass-blades which flourish over the killing grounds, especially on the leaf-stalks of the Elymus, causing this vegetation, on the whole slaughtering-field and vicinity, to fairly droop to earth as if beaten down by a tornado of wind and rain. It makes the landscape look as though it had molded in the night, and the fungoid spores were blue and gray. Our common house-fly is not present; I never saw one while I was up there. The flesh-flies which I have just mentioned never came into the dwellings unless by accident: the natives say they do not annoy them, and I did not notice any disturbance among the few animals which the resident company had imported for beef and for service.

Then, again, this is perhaps the only place in all Alaska where man, primitive and civilized, is not cursed by mosquitoes. There are none here. A gnat, that is disagreeably suggestive of the real enemy just referred to, flits about in large swarms, but it is inoffensive, and seeks shelter in the grass. Several species of beetles are also numerous here. One of them, the famous green and gold "carabus", is exceedingly common, crawling everywhere, and is just as bright in the rich bronzing of its wing-shields as are its famous prototypes of Brazil. One or two species of *Ichnumon*, a *Cymindis*, several representatives of the *Aphidiphaga*, one or two of *Dytiscidae*, three or four *Cicindelide*—these are nearly all that I found. A single dragon-fly, *Perla bicaudata*, flitted over the lakes and ponds of St. Paul. The, to our eyes, familiar form of the bumble-bee, *Bombus borealis*, passing from flower to flower, was rarely seen; but a few are here resident. The *Hydrocoriscæ* occur in great abundance, skipping over the water in the lakes and pools everywhere, and a very few species of butterflies, principally the yellow *Nymphalide*, are represented by numerous individuals.

LAND MAMMALS.—Aside from the seal-life on the Pribylov islands, there is no indigenous mammalian creature, with the exception of the blue and white foxes, *Vulpes lagopus*, and the lemming, *Myodes obensis*. The latter is

restricted, for some reason or other, to the island of St. George, where it is, or at least was, in 1874, very abundant. Its burrows and paths, under and among the grassy hummocks and mossy flats, checkerboard every square rod of land there covered with this vegetation. Although the island of St. Paul is but 29 or 30 miles to the northwest, not a single one of these active, curious little animals is found on it, nor could I learn from the natives that it had ever been seen there. The foxes are also restricted to these islands; that is, their kind, which are not found elsewhere, except the stray examples on St. Matthew seen by myself, and those which are carefully domesticated and preserved at Attou, the extreme westernmost land of the Aleutian chain. These animals find comfortable holes for their accommodation and retreat on the seal-islands, among the countless chinks and crevices of the basaltic formation. They feed and grow fat upon sick and weakly seals, also devouring many of the pups, and they vary this diet by water-fowl and eggs* during the summer, returning for their subsistence during the long winter to the bodies of seals upon the breeding-grounds and the skinned carcasses left upon the killing-fields. Were they not regularly hunted from December until April, when their fur is in its prime beauty and condition, they would swarm like the lemming on St. George, and perhaps would soon be obliged to eat one another. The natives, however, thin them out by incessant trapping and shooting during the period when the seals are away from the islands.

The Pribylov group is as yet free from rats; at least, none have got off from the ships. There is no harbor at either of these islands, and the ships lie out in the roadstead, so far from land that these pests do not venture to swim to the shore. Mice were long ago brought to shore in ships' cargoes, and they are a great nuisance to the white people as well as the natives throughout the islands. Hence cats also are abundant. Nowhere perhaps in the wide world are such cats to be seen as these. The tabby of our acquaintance, when she goes up there and lives upon the seal-meat spread everywhere under her nose, is metamorphosed, by time of the second generation, into a stubby feline ball; in other words, she becomes thickened, short, and loses part of the normal length of her tail; also her voice is prolonged and resonant far beyond the misery which she inflicts upon our ears here. These cats actually swarm about the natives' houses, never in them much, for only a tithe of their whole number can be made pets of; but they do make night hideous beyond all description. They repair for shelter, often, to the chinks of precipices, and bluffs, but, although not exactly wild, yet they cannot be approached or cajoled. The natives, when their sluggish wits are periodically thoroughly aroused and disturbed by the volume of cat-calls in the village, sally out and by a vigorous effort abate the nuisance for the time being. The most extravagant caterwauling alone will or can arouse this Aleutian ire.

STOCK AND POULTRY-RAISING.—On account of the severe climatic conditions it is of course impracticable to keep stock here with any profit or pleasure. The experiment has been tried faithfully. It is found best to bring beef-cattle up in the spring on the steamer, turn them out to pasture until the close of the season, in October and November, and then, if the snow comes, to kill them and keep them refrigerated the rest of the year. Stock cannot be profitably raised here, the proportion of severe weather annually is too great—from three to perhaps six months of every year they require feeding and watering, with good shelter. To furnish an animal with hay and grain up there is a costly matter, and the dampness of the growing summer season on both islands renders hay-making impracticable. Perhaps a few head of hardy Siberian cattle might pick up a living on the north shore of St. Paul, among the grasses and sand-dunes there, with nothing more than shelter and water given them, but they would need both of those attentions. Then the care of them would hardly return expenses, as the entire grazing ground could not support any number of animals. It is less than two square miles in extent, and half of this area is unproductive. Then, too, a struggle for existence would reduce the flesh and vitality of these cattle to so low an ebb, that it is doubtful whether they could be put through another winter alive, especially if severe. I was then, and am now, strongly inclined to think, that if a few of those Siberian reindeer could be brought over to St. Paul and to St. George, they would make a very successful struggle for existence, and be a source of a good supply, summer and winter, of fresh meat for the agents of the government and the company who may be living upon the islands. I do not think that they would be inclined to molest or visit the seal-grounds; at least, I noticed that the cattle and mules of the company running loose on St. Paul, were careful never to poke around on the outskirts of a rookery, and deer would be more timid and less obtrusive than our domesticated animals. But I did notice on St. George that a little squad of sheep, brought up and turned out there for a summer's feeding, seemed to be so attracted by the quiet calls of the pups on the rookeries, that they were drawn to and remained by the seals without disturbing them at all, to their own physical detriment, for they lost better

* The temerity of the fox is wonderful to contemplate, as it goes on a full run or stealthy tread up and down along the faces of almost inaccessible bluffs, in search of old and young birds and their nests and eggs, for which the "peestchee" have a keen relish. The fox always brings the egg up in its mouth, and, carrying it back a few feet from the brink of the precipice, leisurely and with gusto breaks the larger end and sucks the contents from the shell. One of the curious sights of my notice in this connection, was the sly, artful, and insidious advances of Reynard at Tolstoi Mees, St. George, where, conspicuous and elegant in its fluffy white dress, it cunningly stretched on its back as though dead, making no sign of life whatever, save to gently hoist its thick brush now and then; whereupon many dull, curious sea-birds, *Graculus bicristatus*, in their intense desire to know all about it, flew in narrowing circles overhead, lower and lower, closer and closer, until one of them came within the sure reach of a sudden spring and a pair of quick snapping jaws, while the gulls and others, rising safe and high above, screamed out in seeming contempt for the struggles of the unhappy "slag", and rendered hideous approbation.

pasturage by so doing. The natives of St. Paul have a strange passion for seal-fed pork, and there are quite a large number of hogs on the island of St. Paul and a few on St. George. The pigs soon become entirely carnivorous, living, to the practical exclusion of all other diet, on the carcasses of seals.

Chickens are kept with much difficulty, in fact it is only possible to save their lives when the natives take them into their own rooms, or keep them above their heads, in their dwellings, during winter.

BIRD-LIFE.—While the great exhibition of pinnipedia preponderates over every other feature of animal life on the seal-islands, still we find a wonderful aggregate of ornithological representation thereon. The spectacle of birds nesting and breeding, as they do at St. George island, to the number of millions, flocking those high basaltic bluffs of its shore-line, 29 miles in length, with color-patches of black, brown, and white, as they perch or cling to the mural cliffs in the labor of incubation, is a sight of exceeding attraction and constant novelty. It affords the naturalist an opportunity of a life-time for minute investigation into all the details of the reproduction of these vast flocks of circumboreal water-fowl. The island of St. Paul, owing to the low character of its shore-line, a large proportion of which is but slightly elevated above the sea and is sandy, is not visited, and cannot be visited, by such myriads of birds as are seen at St. George; but the small, rocky Walrus islet is fairly covered with sea-fowls, and the Otter island bluffs are crowded by them to their utmost capacity of reception. The birds string themselves anew around the cliffs with every succeeding season, like endless ribbons stretched across their rugged faces, while their numbers are simply countless. The variety is not great, however, in these millions of breeding-birds. It consists of only ten or twelve names; the whole list of avifauna belonging to the Pribilof islands, stragglers and migratory, contains but 40 species. Conspicuous among the last-named class is the robin, a straggler which was brought from the main land, evidently against its own effort, by a storm or a gale of wind, which also brings against their will the solitary hawks, owls, and waders, occasionally noticed here.

After the dead silence of a long ice-bound winter, the arrival of large flocks of those sparrows of the north, the "chlochkies," *Plalaris microceros*, is most cheerful and interesting. Those plump little auks are bright, fearless, vivacious birds, with bodies round and fat. They come usually in chattering flocks on or immediately after the 1st of May, and are caught by the people with hand-scoops or dip-nets to any number that may be required for the day's consumption; their tiny, rotund forms making pies of rare, savory virtue, and being also baked and roasted and stewed in every conceivable shape by the Russian cooks—indeed they are equal to the reed-birds of the South. These welcome visitors are succeeded along about the 20th of July by large flocks of fat, red-legged turn-stones, *Sirepsilas interpres*, which come in suddenly from the west or north, where they have been breeding, and stop on the islands for a month or six weeks, as the case may be, to feed luxuriantly upon the flesh-flies, which we have just noticed, and their eggs. Those handsome birds go in among the seals, familiarly chasing the flies, gnats, etc. They are followed, as they leave in September, by several species of jack-snipe and a plover, *Tringa* and *Charadrius*; these, however, soon depart, as early as the end of October and the beginning of November, and then winter fairly closes in upon the islands; the loud, roaring, incessant seal-din, together with the screams and darkening flight of innumerable water-fowl, are replaced in turn again by absolute silence, marking out as it were in lines of sharp and vivid contrast, summer's life and winter's death.

The author of that quaint old saying, "Birds of a feather flock together," might well have gained his inspiration had he stood under the high bluffs of St. George at any season, prehistoric or present, during the breeding of the water-birds there, where myriads of croaking murres and flocks of screaming gulls darken the light of day with their fluttering forms, and deafen the ear with their shrill, harsh cries as they do now, for music is denied to all those birds of the sea. Still, in spite of the apparent confusion, he would have taken cognizance of the fact, that each species had its particular location and kept to its own boundary, according to the precision of natural law.

FISHES.—With regard to the herpetology of the islands, I may state that the most careful search on my part was not rewarded by the discovery of a single reptile. In the province of ichthyology I gathered only a few specimens, the scarcity of fish being easily traceable to the presence of the seals on the grounds here. Naturally enough the finny tribes avoid the seal-churned waters for at least one hundred miles around. Among the few specimens, however, which I collected, three or four species new to natural science were found and have since been named by experts in the Smithsonian Institution.

The presence of such great numbers of amphibian mammalia about the waters, during five or six months of every year, renders all fishing abortive, and unless expeditions are made seven or eight miles at least from the land, and you desire to catch large halibut, it is a waste of time to cast your line over the gunwhale of the boat. The natives capture "poltoos" or halibut, *Hippoglossus vulgaris*, within two or three miles of the Reef-point on St. Paul and the south shore during July and August. After this season the weather is usually so stormy and cold that the fishermen venture no more until the ensuing summer.

AQUATIC INVERTEBRATES.—With regard to the *Mollusca* of the Pribilof waters, the characteristic forms of *Toroglossata* and *Heteroglossata* peculiar to this north latitude are most abundant; of the *Cephalopoda* I have seen only a species of squid, *Sepia loligo*. The clustering whelks, *Buccinoid*, literally conceal large areas of the bowlders on the beaches here and there; they are in immense numbers, and are crushed under your foot at almost

every step when you pass over long reaches of rocky shingle at low tide. A few of the larger *Fusus* are found, and the live and dead shells of *Limacina* are in great abundance wherever the floating kelp-beds afford them shelter.

On land a very large number of shells of the genera *Succinea* and *Pupa* abound all over the islands; on the bluffs of St. George just over Garden cove I gathered a beautiful *Helix*.

The little fresh-water lakes and ponds contain a great quantity of representatives of the characteristic genera *Planorbis*, *Melania*, *Limnea*, and that pretty little bivalve, the *Cycas*.

Of the *Crustacea*, the *Annelide*, and *Echinodermata*, there is abundant representation here. The sea-urchins, "replikie" of the natives, are eagerly sought for at low tide and eaten raw by them. The Arctic sea-clam, *Mya truncata*, is once in a long time found here (it is the chief food of the walrus of Alaska), and the species of *Mytilus*, the mussels, so abundant in the Aleutian archipelago, are almost absent here at St. Paul, and only sparingly found at St. George.

The waters fairly swarm with an enormous number and variety of *Medusa* or jelly-fishes.

The sea-weeds are exceedingly varied and abundant here, great heaps of their assorted fronds are tossed up by every gale to rot upon the beaches.

DIMENSIONS AND CONTOUR OF THE ISLANDS.—Until my arrival on the seal islands in April, 1872, no steps had ever been taken by any man whomsoever toward ascertaining the extent and the real importance of these interests of the government; the Russians never having made even an approximate survey of the land, while our own people did no better. I was very much surprised, immediately after landing, and calling for a map of the island of St. Paul, to have an odd sketch, traced from an old Russian chart, placed before me, that my eye stamped instantly as grotesque, by the land-bearings which I took out of my window on the spot. It was a matter of no special concern, however, to the Russians; had it been, doubtless they would have accurately surveyed the whole field. But it was and is quite different with us; and, that no agent of the Treasury Department, or other branches of the government, had, up to the date of my arrival, given it the slightest thought or attention, struck me as rather strange. It was, as it is, and ever will be, a matter of first importance to a correct and succinct understanding of the subject, and it was the first thing about which I busied myself. I present, therefore, with this memoir, a careful chart of each island and the contiguous islets, which are the first surveys ever made upon the ground having the slightest pretension to accuracy.* The reader will observe, as he turns to these maps, the striking dissimilarity which exists between them, not only in contour but in physical structure, the island of St. Paul being the largest in superficial area, and receiving a vast majority of the *Pinnipedia* that belong to both. As it lies in Bering sea to-day, this island is in its greatest length, between northeast and southwest points, 13 miles, air line; and a little less than 6 at points of greatest width. It has a superficial area of about 33 square miles, or 21,120 acres, of diversified, rough, and rocky uplands, rugged hills, and smooth, volcanic cones, which either set down boldly to the sea or fade out into extensive wet and mossy flats, passing at the sea-margin into dry, drifting, sand-dune tracts. It has 42 miles of shore-line, and of this coast, 16½ miles are hauled over by fur-seals *en masse*. At the time of its first upheaval above the sea, it doubtless presented the appearance of ten or twelve small rocky, bluff islets and points, upon some of which were craters that vomited breccia and cinders, with little or no lava overflowing. Active plutonic agency must have soon ceased after this elevation, and then the sea around about commenced the work which it is now engaged in: of building on to the skeleton thus created; and it has progressed to-day so thoroughly and successfully in its labor of sand-shifting, together with the aid of ice-floes, in their action of grinding, lifting, and shoving, that nearly all of these scattered islets within the present area of the island, and marked by its bluffs and higher uplands, are completely bound together by ropes of sand, changed into enduring bars and ridges of water-worn boulders. These are raised above the highest tides by winds that whirl the sand up, over, and on them, as it drives out from the wash of the surf and from the interstices of the rocks, lifted up and pushed by ice-fields.

LAND AND SCENERY.—The sand which plays so important a part in the formation of the island of St. Paul, and which is almost entirely wanting in and around the others in this Pribylov group, is principally composed of *Foraminifera*, together with *Diatomacea*, mixed in with a volcanic base of fine comminuted black and reddish lavas and old friable gray slates. It constitutes the chief beauty of the sea-shore here, for it changes color like a chameleon, as it passes from wet to dry, being a rich steely-black at the surf-margin and then drying out to a soft purplish-brown and gray, succeeding to tints most delicate of reddish and pale neutral, when warmed by the sun and drifting up on to the higher ground with the wind. The sand-dune tracts on this island are really attractive in the summer, especially so during those rare days when the sun comes forth—the unwonted light shimmers over them and the most luxuriant grass and variety of beautiful flowers, which exist in profusion thereon. In past time, as these sand and boulder bars were forming on St. Paul island, they, in making across from islet to islet, inclosed small bodies of sea-water. These have, by evaporation and time, by the flooding of rains and annual melting of snow, become, nearly every one of them, fresh; they are all, great and small, well shown on my map, which locates quite a large area of pure water. In them, as I have hinted, are no reptiles; but an exquisite species of tiny viviparous fish

* These surveys have since been confirmed and elaborated by H. W. McIntyre, of the A. C. Co., and Lieut. Washburn Maynard, U. S. N.

exists in the lagoon-estuary near the village, and the small pure-water lakes of the natives just under the flanks of Telegraph hill. The Aleuts assured me that they had caught fish in the great lake toward Northeast point, when they lived in their old village out there, but I never succeeded in getting a single specimen. The waters of these pools and ponds are fairly alive with vast numbers of minute *Rotifera*, which sport about in all of them whenever they are examined. Many species of water-plants, pond-lilies, algae, etc., are found in the inland waters, especially in the large lake "Mee-sulk-mah-nee", that is very shallow.

The backbone of the island, running directly east and west, from shore to shore, between Polavina point and Einahuhto hills, constitutes the high land of the island: Polavina Sopka, an old extinct cinder-crater, 550 feet; Doga Slov, an upheaved mass of splinted lava, 600 feet; and the hills frowning over the bluffs there, on the west shore, are also 600 feet in elevation above the sea. But the average height of the upland between is not much over 100 to 150 feet above water-level, rising here and there into little hills and broad, rocky ridges, which are minutely sketched upon the map. From the northern base of Polavina Sopka a long stretch of low sand-flats extend, inclosing the great lake, and ending in a narrow neck where it unites with Novostoshnah, or Northeast point. Here the volcanic nodule known as Hutchinson's hill, with its low, gradual slopes, trending to the east and southward, makes a rocky foundation secure and broad, upon which the great single rookery of the island, the greatest in the world, undoubtedly, is located. The natives say that when they first came to these islands, Novostoshnah was an island by itself, to which they went in boats from Vesolia Mista; and the lagoon now so tightly inclosed was then an open harbor, in which the ships of the old Russian company rode safely at anchor. To-day no vessel drawing ten feet of water can get nearer than half a mile of the village, or a mile from this lagoon.

LACK OF HARBORS: ANCHORAGES.—The total absence of a harbor at the Pribylov islands is much to be regretted. The village of St. Paul, as will be seen by reference to the map, is so located as to command the best landings for vessels that can be made during the prevalence of any and all winds, except those from the south. From these there is no shelter for ships, unless they run around to the north side, where they are unable to hold practicable communication with the people or to discharge. At St. George matters are still worse, for the prevailing northerly, westerly, and easterly winds drive the boats away from the village roadstead, and weeks often pass at either island, but more frequently at the latter, ere a cargo is landed at its destination. Under the very best circumstances, it is both hazardous and trying to load and unload ship at any of these places. The approach to St. Paul by water during thick weather, is doubtful and dangerous, for the land is mostly low at the coast, and the fogs hang so dense and heavy over and around the hills as to completely obliterate their presence from vision. The captain fairly feels his way in, by throwing his lead-line and straining his ear to catch the muffled roar of the seal-rookeries, which are easily detected when once understood, high above the booming of the surf. At St. George, however, the bold, abrupt, bluffly coast everywhere all around, with its circling girdle of flying water-birds far out to sea, looms up quite prominently, even in the fog; or, in other words, the navigator can notice it before he is hard aground or struggling to haul to windward from the breakers under his lee. There are no reefs making out from St. George worthy of notice, but there are several very dangerous and extended ones peculiar to St. Paul, which Captain John G. Baker, in command of the vessel* under my direction, carefully sounded out, and which I have placed upon my chart for the guidance of those who may sail in my wake hereafter.

When the wind blows from the north, northwest, and west to southwest, the company's steamer trips her anchor in eight fathoms of water abreast of the Black Bluffs opposite the village, from which anchorage her stores are lightered ashore; but in the northeasterly, easterly, and southeasterly winds, she hauls around to the Lagoon bay west of the village, and there, little less than half a mile from the landing, she drops her anchor in nine fathoms of water, and makes considerable headway at discharging the cargo. Sailing craft come to both anchorages, but, however, keep still farther out, though they choose relatively the same positions, but seek deeper water to swing to their cables in: the holding-ground is excellent. At St. George the steamer comes, wind permitting, directly to the village on the north shore, close in, and finds her anchorage in ten fathoms of water, in poor holding-ground; but it is only when three or four days have passed free from northerly, westerly, or easterly winds, that she can make the first attempt to safely unload. The landing here is a very bad one, surf breaking most violently upon the rocks from one end of the year to the other.

OTTER ISLAND.—The observer will notice that six miles southward and westward of the reef of St. Paul island, is a bluffly islet, called by the Russians Otter island, because in olden time the Promyshlenniks are said to have captured many thousands of sea-otters on its stony coast. It rises from the ocean, sheer and bold, an unbroken mural precipice extending nearly all around, of sea-front, but dropping on its northern margin, at the water, low, and slightly elevated above the surf-wash, with a broken, rocky beach and no sand. The height of the cliffs, at their greatest elevation over the west end, is 300 feet, while the eastern extremity is quite low, and terminated by a queer, funnel-shaped crater-hill, which is as distinctly defined, and as plainly scorched, and devoid of the slightest sign of vegetation within, as though it had burned up and out yesterday. This crater-point on Otter island is the only unique feature of the place, for with the exception of that low north shore, before mentioned, where many thousand of "bachelor seals" haul out during the season every year, there is nothing else worthy of notice concerning it. A

* United States revenue-marine cutter Reliance, June to October, 1871.

bad reef makes out to the westward and northward, which I have indicated from my observation of the rocks awash, looking down upon them from the bluffs. Great numbers of water-fowl roost upon the cliffs, and there are here about as many blue foxes to the acre as the law of life allows. A small, shallow pool of impure water lies close down to the north shore, right under a low hill, upon which the Russians in olden time posted a huge Greek cross, that is still standing; indeed, it was their habit to erect crosses on all the hills in those olden times; one of them is standing at Northeast point, on the large sand-dune which I have called St. John or Cross hill; and another one, a sound, stalwart stick, yet faces the gale and driving "boorgas" to-day on Boga Slov, as it has faced them for the last sixty years.

Otter island has, since my return in 1872, had considerable attention in the Treasury Department, owing to the fact that certain parties

contended that it lies without the jurisdiction of the law which covers and protects the seal-life on the Pribylov islands. This survey of mine, however, settles that question: the island is within the pale of law. It is a rock adjacent to and in the waters of St. Paul, and resorted to only by those seals which are born upon and belong to the breeding-grounds of St. Paul and St. George, and I have never seen at any one time more than three or four thousand "holluschickie" hauled out here.

WALRUS ISLAND.—To the eastward, six miles from Northeast point, will be noticed a small rock named Walrus island. It is a mere ledge of lava, flat-capped, lifted just above the wash of angry waves; indeed, in storms of great power, the observer, standing on either Cross or Hutchinson's hills, with a field-glass, can see the water breaking clear over it. These storms, however, occur late in the season, usually in October or November. This island has little or no commercial importance, being scarcely more than a quarter of a mile in length and 100 yards in point of greatest width, with bold water all around, entirely free from reefs or sunken rocks. As might be expected, there is no fresh water on it. In a fog it makes an ugly neighbor for the sea-captains when they are searching for St. Paul; they all know it, and they all dread it. It is not resorted to by the fur-seals or by sea-lions in particular; but, singularly enough, it is frequented by several hundred male walrus, to the exclusion of females, every summer. A few sea-lions, but only a very few, however, breed here. On account of the rough weather, fogs, etc., this little islet is seldom visited by the natives of St. Paul, and then only in the eggging season of late June and early July; then that surf-beaten rock literally swarms with breeding water-fowl.

This low, tiny, rocky islet is, perhaps, the most interesting single spot now known to the naturalist, who may land in northern seas, to study the habits of bird-life; for here, without exertion or risk, he can observe and walk among tens upon tens of thousands of screaming water-fowl, and as he sits down upon the polished lava rock, he becomes literally ignored and environed by these feathered friends, as they reassume their varied positions of incubation, which he disturbs them from by his arrival. Generation after generation of their kind have resorted to this rock unmolested, and to-day, when you get among them, all doubt and distrust seems to have been eliminated from their natures. The island itself is rather unusual in those formations which we find peculiar to Alaskan waters. It is almost flat, with slight, irregular undulations on top, spreading over an area of five acres, perhaps. It rises abruptly, though low, from the sea, and it has no safe beach upon which a person can land from a boat; not a stick of timber or twig of shrubbery ever grew upon it, though the scant presence of low, crawling grasses in the central portions prevents the statement that *all* vegetation is absent. Were it not for the frequent rains and dissolving fog, characteristic of summer weather here, the guano accumulation would be something wonderful to contemplate—Peru would have a rival. As it is, however, the birds, when they return, year after year, find their nesting-floor swept as clean as though they had never sojourned there before. The scene of confusion and uproar that presented itself to my astonished senses when I approached this place in search of eggs, one threatening, foggy July morning, may be better imagined than described, for as the clumsy bidarra came under the lee of the low cliffs, swarm upon swarm of thousands of murre or "aries" dropped in fright from their nesting-shelves, and before they had control of their flight, they struck to the right and left of me, like so many cannon balls. I was forced, in self-protection, to instantly crouch for a few moments under the gunwale of the boat until the struggling, startled flock passed, like an irresistible, surging wave, over my head. Words cannot depict the amazement and curiosity with which I gazed around, after climbing up to the rocky plateau and standing among myriads of breeding-birds, that fairly covered the entire surface of the island with their shrinking forms, while others whirled in rapid flight over my head, as wheels within wheels, so thickly inter-running that the blue and gray of the sky



[Bearing west by compass, 3 miles distant.]



PROFILE OF THE NORTH SHORE OF OTTER ISLAND (from steamer's anchorage, Zoltoi bay, St. Paul).

[Bearing south by compass, 6 miles distant.]

was hidden from my view. Add to this impression the stunning whirl of hundreds of thousands of strong, beating wings, the shrill screams of the gulls, and the muffled croaking of the "aries", coupled with an indescribable, disagreeable smell which arose from the broken eggs and other decaying substances, and a faint idea may be evoked of the strange reality spread before me. Were it not for this island and the ease with which the natives can gather, in a few hours, tons upon tons of sea-fowl eggs, the people of the village would be obliged to go to the westward, and suspend themselves from the lofty cliffs of Einalnukto, dangling over the sea by ropes, as their neighbors are only too glad and willing to do at St. George.

ST. PAUL.—A glance at the map of St. Paul, shows that nearly half of its superficial area is low and quite flat, not much elevated above the sea. Wherever the sand-dune tracts are located, and that is right along the coast, is found an irregular succession of hummocks and hillocks, drifted by the wind, which are very characteristic. On the summits of these hillocks the *Elymus* has taken root in times past, and, as the sand drifts up, it keeps growing on and up, so that the quaint spectacle is presented of large stretches to the view, wherein sand-dunes, entirely bare of all vegetation at their base and on their sides, are crowned with a living cap of the brightest green—a tuft of long, waving grass blades which will not down. None of this peculiar landscaping, however, is seen on St. George, not even in the faintest degree. Travel about St. Paul, with the exception of the road to Northeast point, where the natives take advantage of low water to run on the hard, wet sand, is exceedingly difficult, and there are examples of only a few white men who have ever taken the trouble and expended the physical energy necessary to accomplish the comparatively short walk from the village to Nahsayvernina, or the north shore. Walking over the moss-hidden and slippery rocks, or tumbling over slightly uncertain tussocks, is a task and not a pleasure. On St. George, with the exception of a half-mile path to the village cemetery and back, nobody pretends to walk, except the natives who go to and from the rookeries in their regular seal-drives. Indeed, I am told that I am the only white man who has ever traversed the entire coast-line of both islands. (See note, 39, E.)

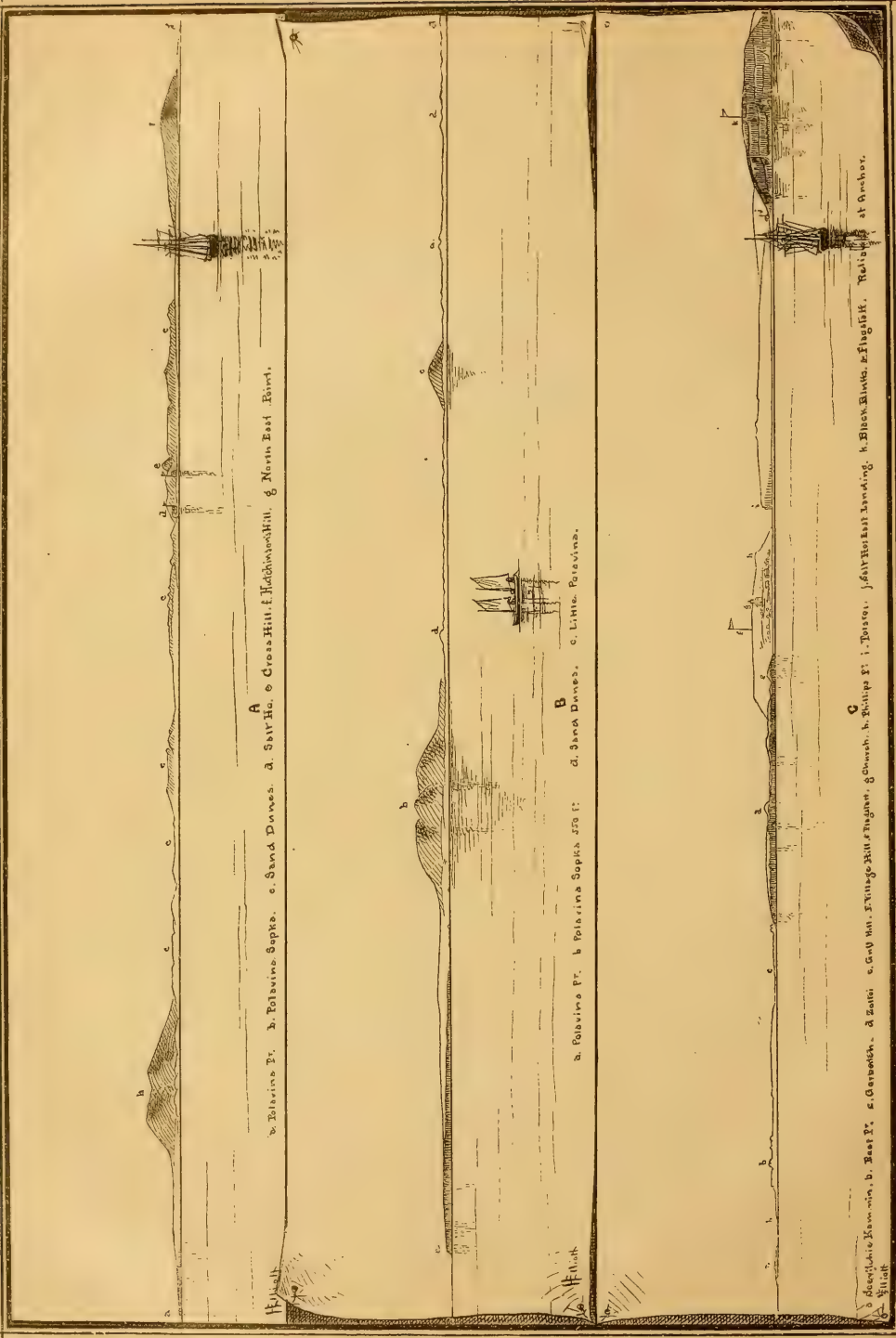
ST. GEORGE.—Turning to St. George and its profile, presented by the accompanying map, the observer will be struck at once by the solidity of that little island and its great boldness, rising, as it does, sheer and precipitous from the sea all around, except at the three short reaches of the coast indicated on the chart, and where the only chance to come ashore exists.

The seals naturally have no such opportunity to gain a footing here as they have on St. Paul, hence their comparative insignificance as to number. The island itself is a trifle over ten miles in extreme length, east and west, and about four and a quarter miles in greatest width, north and south. It looks, when plotted, somewhat like an old stone ax; and, indeed, when I had finished my first contours from my field-notes, the ancient stone-ax outline so disturbed me that I felt obliged to resurvey the southern shore, in order that I might satisfy my own mind as to the accuracy of my first work. It consists of two great plateaus, with a high upland valley between, the western table-land dropping abruptly to the sea at Dalnoi Mees, while the eastern falls as precipitately at Waterfall Head and Tolstoi Mees. There are several little reservoirs of fresh water—I can scarcely call them lakes—on this island; pools, rather, that the wet sphagnum seems to always keep full, and from which drinking-water in abundance is everywhere found. At Garden cove a small stream, the only one on the Pribylov group, empties into the sea.

St. George has an area of about 27 square miles; it has 29 miles of coast-line, of which only two and a quarter are visited by the fur-seals, and which is in fact all the eligible landing-ground afforded them by the structure of the island. Nearly half of the shore of St. Paul is a sandy beach, while on St. George there is less than a mile of it all put together, namely, a few hundred yards in front of the village, the same extent on the Garden cove beach southeast side, and less than half a mile at Zapadni on the south side.

Just above the Garden cove, under the overhanging bluffs, several thousand sea-lions hold exclusive, though shy, possession. Here there is a half mile of good landing. On the north shore of the island, three miles west from the village, a grand bluff wall, of basalt and tufa intercalated, rises abruptly from the sea to a sheer height of 920 feet at its reach of greatest elevation, thence, dropping a little, runs clear around the island to Zapadni, a distance of nearly 10 miles, without affording a single passage-way up or down to the sea that thunders at its base. Upon its innumerable narrow shelf-margins, and in its countless chinks and crannies, and back therefrom over the extended area of lava-shingled inland ridges and terraces, millions upon millions of water-fowl breed during the summer months.

The general altitude of St. George, though in itself not great, has, however, an average three times higher than that of St. Paul, the elevation of which is quite low, and slopes gently down to the sea east and north; St. George rises abruptly, with exceptional spots for landing. The loftiest summit on St. George, the top of the hill right back to the southward of the village, is 930 feet, and is called by the natives Ahluckeyak. That on St. Paul, as I have before said, is Boga Slov hill, 600 feet. All elevations on either island, 15 or 20 feet above sea-level, are rough and hummocky, with the exception of the sand-dune tracts at St. Paul and the summits of the cinder hills, on both islands. Weathered out or washed from the basalt and pockets of olivine on either island are aggregates of augite, seen most abundant on the summit slopes of Ahluckeyak hill, St. George. Specimens from the stratified bands of old, friable, gray lavas, so conspicuous on the shore of this latter island, show the existence of hornblende and vitreous feldspar in considerable quantity, while on the south shore, near the Garden cove, is a large dike of a bluish and greenish gray phonolith, in which numerous small crystals of spinel are found. A dike, with well-defined



PROFILES OF THE EAST COAST OF ST. PAUL ISLAND.

- A. Northeast shore of St. Paul Island, from a point at sea, about 8 miles distant to eastward, magnetic.
- B. Polovina Sopka and Point, from a seaward view, 3 miles distant; the mountain bearing west, magnetic.
- C. Village and East Landing from the usual anchorage there; 1 mile distant.

walls of old, close-grained, clay-colored lava, is near the village of St. George, about a quarter of a mile east from the landing, in the face of those reddish breccia bluffs that rise from the sea. It is the only example of the kind on the islands. The bases or foundations of the Pribylov islands are, all of them, basaltic; some are compact and grayish-white, but most of them exceedingly porous and ferruginous. Upon this solid floor are many hills of brown and red tufa, cinder-heaps, etc. Polavina Sopka, the second point in elevation on St. Paul island, is almost entirely built up of red scoria and breccia; so is Ahlukeyak hill, on St. George, and the cap to the high bluffs opposite. The village hill at St. Paul, Cone hill, the Einahnuto peaks, Crater hill, North hill, and Little Polavina are all ash-heaps of this character. The bluffs at the shore of Polavina point, St. Paul, show in a striking manner a section of the geological structure of the island. The tufas on both islands, at the surface, decompose and weather into the base of good soil, which the severe climate, however, renders useless to the husbandman. There is not a trace of a granitic or a gneissic rock found *in situ*. Metamorphic bowlders have been collected along the beaches and pushed up by the ice-floes which have brought them down from the Siberian coast away to the northwest. The dark-brown tufa bluffs and the breccia walls at the east landing of St. Paul island, known as "Black bluffs", rise suddenly from the sea 60 to 80 feet, with stratified horizontal lines of light-gray calcareous conglomerate, or cement, in which are imbedded sundry fossils characteristic of and belonging to the Tertiary age, such as *Cardium groenlandicum*, *C. decoratum*, and *Astarte pectunculata*, etc. This is the only locality within the purview of the Pribylov islands where any paleontological evidence of their age can be found. These specimens, as indicated, are exceedingly abundant; I brought down a whole series, gathered there at the east landing or "Navastock", in a short half-hour's search and labor.

WHY THESE ISLANDS ARE FREQUENTED BY FUR-SEALS.—The fact that the fur-seals frequent these islands and those of Bering and Copper, on the Russian side, to the exclusion of other land, seems at first a little singular, to say the least; but when we come to examine the subject we find that these animals, when they repair hither to rest for two or three months on the land, as they must do by their habit during the breeding-season, they require a cool, moist atmosphere, imperatively coupled with firm, well-drained land, or dry, broken rocks, or shingle rather, upon which to take their positions and remain undisturbed by the weather and the sea for the lengthy period of reproduction. If the rookery-ground is hard and flat, with an admixture of loam or soil, puddles are speedily formed in this climate, where it rains almost every day, and when not raining, rain-fogs take quick succession and continue the saturation, making thus a muddy slime, which very quickly takes the hair off the animals whenever it plasters or wherever it fastens on them; hence, they carefully avoid any such landing. If they occupy a sandy shore the rain beats that material into their large, sensitive eyes, and into their fur, so they are obliged, from simple irritation, to leave and hunt the sea for relief.

The seal-islands now under discussion offer to the *Pinnipedia* very remarkable advantages for landing, especially St. Paul, where the ground of basaltic rock and of volcanic tufa or cement slopes up from so many points gradually above the sea, making thereby a perfectly adapted resting-place for any number, from a thousand to millions, of those intelligent animals, which can lie out here from May until October every year in perfect physical peace and security. There is not a rod of ground of this character offered to these animals elsewhere in all Alaska, not on the Aleutian chain, not on the mainland, not on St. Matthew or St. Lawrence. Both of the latter islands were surveyed by myself, with special reference to this query, in 1874; every foot of St. Matthew shore-line was examined, and I know that the fur-seal could not rest on the low clayey lava flats there in contentment a single day; hence he never has rested there, nor will he in the future. As to St. Lawrence, it is so ice-bound and snow-covered in spring and early summer, to say nothing of numerous other physical disadvantages, that it never becomes of the slightest interest to the seals.

D. THE OCCUPANTS OF THE ISLANDS.

5. THE NATIVES OF THE ISLANDS.

COLONIZATION BY RUSSIANS AND ALEUTS: EARLY HISTORY.—When Pribylov, in taking possession, landed on St. George a part of his little ship's crew, July, 1786, he knew that, as it was uninhabited, it would be necessary to create a colony there, from which to draft laborers to do the killing, skinning, and curing of the peltries; therefore he and his associates, and his rivals after him, imported natives of Onalashka and Atkha—passive, docile Aleuts. They founded their first village a quarter of a mile to the eastward of one of the principal rookeries on St. George, now called "Starry Atel", or "Old settlement"; a village was also located at Zapadnie, and a succession of barrabaras planted at Garden cove. Then, during the following season, more men were brought up from Atkha and taken over to St. Paul, where five or six rival traders posted themselves on the north shore, near and at "Maroonitch", and at the head of the Big lake, among the sand-dunes there. They were then as they are now, somewhat given to riotous living, if they only had the chance, and the ruins of the Big lake settlement are pleasantly remembered by the descendants of those pioneers to-day, on St. Paul, who take off their hats as they pass by, to

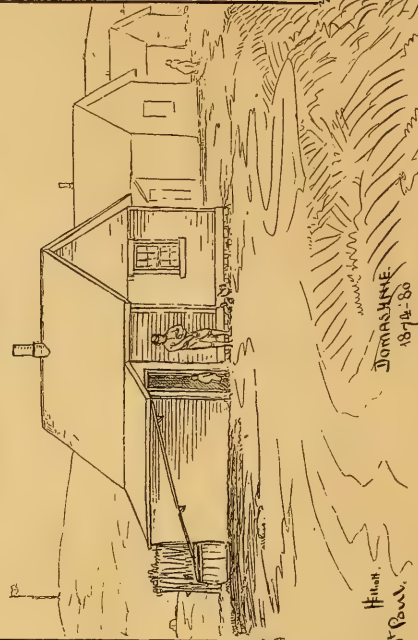
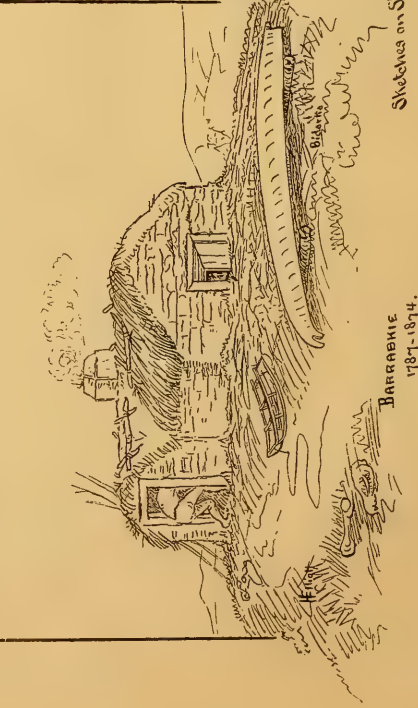
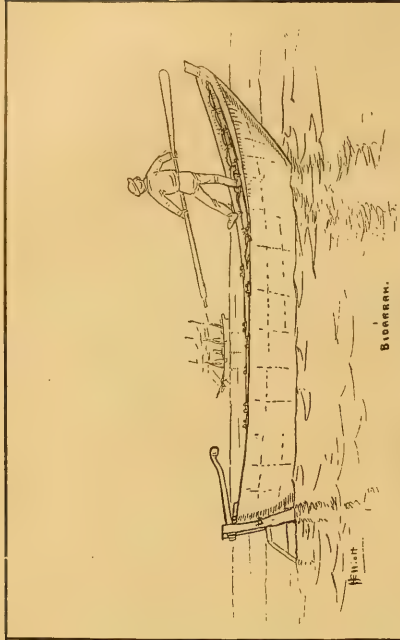
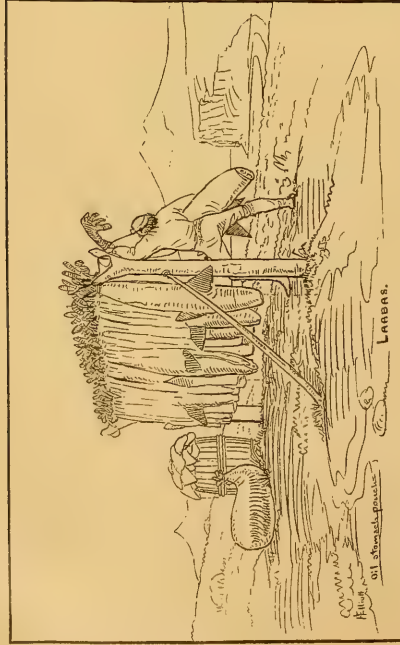
affectionately salute, and call the place "Vesolia Mista", or "Jolly Spot"; the old men telling me, in a low whisper, that "in those good old days they had plenty of rum". But, when the pressure of competition became great, another village was located at Polavina, and still another at Zapadnie, until the activity and unscrupulous energy of all these rival settlements well-nigh drove out and eliminated the seals in 1796. Three years later the whole territory of Alaska passed into the hands of the absolute power vested in the Russian-American Company. These islands were in the bill of sale, and early in 1799 the competing traders were turned off neck and heels from them, and the Pribylov group passed under the control of a single man, the iron-willed Baranov. The people on St. Paul were then all drawn together, for economy and warmth, into a single settlement at Polavina. Their life in those days must have been miserable. They were mere slaves, without the slightest redress from any insolence or injury which their masters might see fit, in petulance or brutal orgies, to inflict upon them. Here they lived and died, unnoticed and uncared for, in large barracoons half under ground and dirt roofed, cold, and filthy. Along toward the beginning or end of 1825, in order that they might reap the advantage of being located best to load and unload ships, the Polavina settlement was removed to the present village site, as indicated on the map, and the natives have lived there ever since.

On St. George the several scattered villages were abandoned, and consolidated at the existing location some years later, but for a different reason. The labor of bringing the seal-skins over to Garden cove, which is the best and surest landing, was so great, and that of carrying them from the north shore to Zapadnie still greater, that it was decided to place the consolidated settlement at such a point between them, on the north shore, that the least trouble and exertion of conveyance would be necessary. A better place, geographically, for the business of gathering the skins and salting them down at St. George cannot be found on the island, but a poorer place for a landing it is difficult to pick out, though in this respect there is not much choice outside of Garden cove.

CONTRAST IN THE CONDITION OF THE INHABITANTS UNDER RUSSIAN AND AMERICAN RULE.—Up to the time of the transfer of the territory and leasing of the islands to the Alaska Commercial Company, in August, 1870, these native inhabitants all lived in huts or sod-walled and dirt-roofed houses, called "barrabkies," partly under ground. Most of these huts were damp, dark, and exceedingly filthy: it seemed to be the policy of the short-sighted Russian management to keep them so, and to treat the natives not near so well as they treated the few hogs and dogs which they brought up there for food and for company. The use of seal-fat for fuel, caused the deposit upon everything within doors of a thick coat of greasy, black soot, strongly impregnated with a damp, moldy, and indescribably offensive odor. They found along the north shore of St. Paul and at Northeast point, occasional scattered pieces of drift-wood, which they used, carefully soaked anew in water if it had dried out, split into little fragments, and, trussing the blubber with it when making their fires, the combination gave rise to a roaring, spluttering blaze. If this drift-wood failed them at any time when winter came round, they were obliged to huddle together beneath skins in their cold huts, and live or die, as the case might be. But the situation to-day has changed marvelously. We see here now at St. Paul, and on St. George, in the place of the squalid, filthy habitations of the immediate past, two villages neat, warm, and contented. Each family lives in a snug frame-dwelling; every house is lined with tarred paper, painted, furnished with a stove, with out-houses, etc., complete; streets laid out, and the foundations of these habitations regularly plotted thereon. There is a large church at St. Paul, and a less pretentious but very creditable structure of the same character, on St. George; a hospital on St. Paul, with a full and complete stock of drugs, and skilled physicians on both islands to take care of the people, free of cost. There is a school-house on each island, in which teachers are also paid by the company eight months in the year, to instruct the youth, while the Russian Church is sustained entirely by the pious contributions of the natives themselves on these two islands, and sustained well by each other. There are 10 families, or 80 houses, on St. Paul, in the village, with 20 or 24 such houses to as many families at St. George, and 8 other structures. The large ware-houses and salt-sheds of the Alaska Commercial Company, built by skillful mechanics, as have been the dwellings just referred to, are also neatly painted; and, taken in combination with the other features, constitute a picture fully equal to the average presentation of any one of our small eastern towns. There is no misery, no downcast, dejected, suffering humanity here to-day. These Aleuts, who enjoy as the price of their good behaviour, the sole right to take and skin seals for the company, to the exclusion of all other people, are known to and by their less fortunate neighbors elsewhere in Alaska as the "Bogatskie Aloutov", or the "rich Aleuts". The example of the agents of the Alaska Commercial Company, on both islands, from the beginning of its lease, and the course of the treasury agents* during the last four or five years, have been silent but powerful promoters of the welfare of these people. They have maintained perfect order: they have directed neatness, and cleanliness, and stimulated industry, such as those natives had never before dreamed of.

NUMBER AND CONDITION OF THE ISLANDERS IN 1880.—The population of St. Paul is, at the present writing, 298. Of these, 14 are whites (13 males and 1 female), 128 male Aleutians, and 156 females. On St. George we have 92 souls: 4 white males, 35 male Aleutians, and 53 females, a total population on these islands of 390. This is an increase of between 30 and 40 people since 1873. Prior to 1873, they had neither much increased nor diminished for 50 years, but would have fallen off rapidly (for the births were never equal to the deaths) had not

* Messrs. Morton, Falconer, Otis, Moulton, Scribner, and Beaman.



SEAL-MEAT FRAME, LIGHTER, HUT, AND HOUSES AT ST. PAUL ISLAND.

recruits been regularly drawn from the mainland and other islands every season when the ships came up. As they lived then, it was a physical impossibility for them to increase and multiply; but, since their elevation and their sanitary advancement are so marked, it may be reasonably expected that those people for all time to come will at least hold their own, even though they do not increase to any remarkable degree. Perhaps it is better that they should not. But it is exceedingly fortunate that they do sustain themselves so as to be, as it were, a prosperous corporate factor, entitled to the exclusive privilege of labor on these islands. As an encouragement for their good behavior the Alaska Commercial Company, in pursuance of its enlightened treatment of the whole subject, so handsomely exhibited by its housing of these people, has assured them that so long as they are capable and willing to perform the labor of skinning the seal-catch every year, so long will they enjoy the sole privilege of participating in that toil and its reward. This is wise on the part of the company, and it is exceedingly happy for the people. They are, of all men, especially fitted for the work connected with the seal-business—no comment is needed—nothing better in the way of manual labor, skilled and rapid, could be rendered by any body of men, equal in numbers, living under the same circumstances, all the year round. They appear to shake off the periodic lethargy of winter and its forced inanition, to rush with the coming of summer into the severe exercise and duty of capturing, killing, and skinning the seals, with vigor and with persistent and commendable energy.

To day only a very small proportion of the population are descendants of the pioneers who were brought here by the several Russian companies, in 1787 and 1788; a colony of 137 souls, it is claimed, principally recruited at Oonalashka and Atkba. I have placed in the appendix, together with other scattered notes, a list of these people who were living on St. Paul island in August, 1873; also showing at the same time those who were living there in 1870. It is a simple record, perhaps of no interest to anybody except those who are intimately associated with the island's. (See note, 39, F.)

ORIGIN AND TRAITS OF THE ALEUTS.—The question as to the derivation of these natives is still a mooted one among ethnologists, for in all points of personal bearing, intelligence, character, as well as physical structure, they seem to form a perfect link of gradation between the Japanese and Eskimos, although their traditions and their language are entirely distinct and peculiar to themselves; not one word or numeral of their nomenclature resembles the dialect of either. They claim, however, to have come first to the Aleutian islands from a "big land to the westward", and that when they came there first they found the land uninhabited, and that they did not meet with any people, until their ancestors had pushed on to the eastward as far as the peninsula and Kadiak. Confirmatory of this legend, or rather highly suggestive of it, is the fact that repeated instances have occurred within our day where Japanese junks have been, in the stress of hurricanes and typhoons, dismantled, and have drifted clear over and on to the reefs and coasts of the Aleutian islands. Only a short time ago, in the summer of 1871, such a craft was so stranded, helpless and at the mercy of the sea, upon the rocky coast of Adak island, in this chain; the few surviving sailors, Japanese, five in number, were, I remember, rescued by a party of Aleutian sea-otter hunters, who took care of them until the vessel of a trader carried them back, by way of Oonalashka, to San Francisco, and from thence they returned to their native land.

The Aleuts on the islands, as they appear to-day, have been so mixed up with Russian, Koloshian, and Kamschadale blood, that they present characteristics, in one way or another, of all the various races of men, from the negro up to the Caucasian. The predominant features among them are small, wide-set eyes, broad and high cheek-bones, causing the jaw, which is full and square, to often appear peaked; coarse, straight, black hair, small, neatly-shaped feet and hands, together with brownish-yellow complexion. The men will average in stature five feet four or five inches; the women less in proportion, although there are exceptions to this rule among them, some being over six feet in height, and others are decided dwarfs. The manners and customs of these people to-day possess nothing in themselves of a barbarous or remarkable character, aside from that which belongs to an advanced state of semi-civilization. They are exceedingly polite and civil, not only in their business with the agents of the company on the seal-islands, but among themselves; and they visit, the one with the other, freely and pleasantly, the women being great gossips. But, on the whole, their intercourse is subdued, for the simple reason that the topics of conversation are few, and, judging from their silent but unconstrained meetings, they seem to have a mutual knowledge, as if by sympathy, as to what may be occupying each other's minds, rendering speech superfluous. It is only when under the influence of beer or strong liquor, that they lose their naturally quiet and amiable disposition; they then relapse into low, drunken orgies and loud, brawling noises. Having been so long under the control and influence of the Russians, they have adopted many Slavie customs, such as giving birthday-dinners, naming their children, etc.; they are remarkably attached to their church, and no other form of religion could be better adapted or have a firmer hold upon the sensibilities of the people. Their inherent chastity and sobriety cannot be commended. They have long since thrown away the uncouth garments of the Russian rule—the shaggy dog skin caps, with coats half seal and half sea-lion—for a complete outfit, *cap-à-piç*, such as our own people buy in any furnishing house; the same boots, socks, underclothing, and clothing, with ulsters and ulsterettes; but the violence of the wind prevents their selecting the hats of our *haut ton* and sporting fraternity. As for the women, they too have kept pace and even advanced to the level of the men, for in these lower races there is much more vanity displayed by the masculine element than the feminine, according to my observation; in other words, I have noticed

a greater desire among the young men than among the young women of savage and semi civilized people to be gaily dressed, and to look fine. But the visits of the wives of our treasury officials and the company's agents to these islands, during the last ten years, bringing with them a full outfit, as ladies always do, of everything under the sun that women want to wear, has given the native female mind an undue expansion up there, and stimulated it to unwonted activity. They watch the cut of the garments, and borrow the patterns; and some of them are very expert dress-makers to-day. When the Russians controlled affairs the women were the hewers of the drift-wood and the drawers of the water. At St. Paul there was no well of drinking-fluid about the village, nor within half a mile of the village; there was no drinking-water unless it was caught in cisterns, and the cistern-water, owing to the particles of seal-fat soot which fall upon the roofs of the houses, is rendered undrinkable; so that the supply for the town, until quite recently, used to be carried by the women from two little lakes at the head of the lagoon, a mile and a half, as the crow flies, from the village, and right under Telegraph hill. This is quite a journey, and when it is remembered that they drink so much tea, and that water has to go with it, some idea of the labor of the old and young females can be derived from an inspection of the map. Latterly, within the last four or five years, the company have opened a spring less than half a mile from the "gorode", which they have plumbed and regulated, so that it supplies them with water now, and renders the labor next to nothing, compared with the former difficulty. But to-day, when water is wanted in the Aleutian houses at St. Paul, the man has to get it, the woman does not; he trudges out with a little wooden firkin or tub on his back, and brings it to the house.

Some of the natives save their money; but there are very few among them, perhaps not more than a dozen, who have the slightest economical tendency. What they cannot spend for luxuries, groceries, and tobacco, they manage to get away with at the gaming-table. They have their misers and their spendthrifts, and they have the usual small proportion who know how to make money and then how to spend it. A few among them who are in the habit of saving, have opened a regular bank-account with the company; some of them have to-day two or three thousand dollars saved, drawing an interest of 9 per cent.

When the ships arrive and go, the great and necessary labor of lightering their cargoes off and on from the roadsteads where they anchor, is principally performed by these people, and they are paid so much a day for their labor, from 50 cents to \$1, according to the character of the service they render; this operation, however, is much dreaded by the ship-captains and sea-going men, whose habits of discipline and automatic regularity and effect of working render them severe critics and impatient coadjutors of the natives, who, to tell the truth, hate to do anything after they have pocketed their reward for sealing; and when they do labor after this, they regard it as an act of very great condescension on their part.

As they are living to-day up there, there is no restraint, such as the presence of policemen, courts of justice, fines, etc., which we employ for the suppression of disorder and maintenance of the law in our own land. They understand that if it is necessary to make them law-abiding, and to punish crime, that such officers will be among them; and hence, perhaps, is due the fact that, from the time that the Alaska Commercial Company has taken charge, in 1870, there has not been one single occasion where the simplest functions of a justice of the peace would or could have been called in to settle any difficulty. This speaks eloquently for their docile nature and their amiable disposition.

Food.—Seal-meat is their staple food, and in the village of St. Paul they consume on an average fully 500 pounds a day the year round; and they are, by the permission of the Secretary of the Treasury, allowed every fall to kill 5,000 or 6,000 seal-pups, or an average of 22 to 30 young "kotickie" for each man, woman, and child in the settlements. The pups will dress 10 pounds each. This shows an average consumption of nearly 600 pounds of seal-meat by each person, large and small, during the year. To this diet the natives add a great deal of butter and many sweet crackers. They are passionately fond of butter—no epicure at home, or butter-taster in Goshen, knows or appreciates that article better than these people do. If they could get all that they desire, they would consume 1,000 pounds of butter and 500 pounds of sweet crackers every week, and indefinite quantities of sugar—the sweetest of all sweet teeth are found in the jaw of the average Aleut. But it is of course unwise to allow them full swing in this matter, for they would turn their stomachs into fermenting tanks if they had full access to an unlimited supply of saccharine food. The company allows them 200 pounds a week. If unable to get sweet crackers they will eat about 300 pounds of hard or pilot bread every week, and in addition to this nearly 700 pounds of flour at the same time. Of tobacco they are allowed 50 pounds per week; candles, 75 pounds; rice, 50 pounds. They burn, strange as it may seem, kerosene oil here to the exclusion of the seal-fat, which literally overruns the island. They ignite and consume over 600 gallons of kerosene oil a year in the village of St. Paul alone. They do not fancy vinegar very much—perhaps 50 gallons a year is used up there. Mustard and pepper are sparingly used, one to one and a half pounds a week for the whole village; beans they peremptorily reject—for some reason or other they cannot be induced to use them. Those who go about the vessels contract a taste for split-pea soup, and a few of them are sold in the village-store. Salt meat, beef or pork, they will take reluctantly, if it is given to and pressed upon them, but they will never buy it. I remember, in this connection, seeing two barrels of prime salt pork and a barrel of prime mess salt beef opened in the company's store, shortly after my arrival in 1872, and, though the people of the village were invited to help themselves, I think I am right in saying



TYPICAL DRESS OF PRIBYLOV NATIVES.

Ordinary attire of men on the killing-grounds.

Ordinary attire of women and young children in the villages

that the barrels were not emptied when I left the island in 1873. They use a very little coffee during the year—not more than 100 pounds—but of tea a great deal. I do not know exactly—I cannot find among my notes a record as to this article—but I can say, that they do not drink less than a gallon of tea apiece per diem. The amount of this beverage which they sip, from the time they rise in the morning until they go to bed late at night, is astounding. Their “samovars”, and, latterly, the regular tea-kettles of our American make, are bubbling and boiling from the moment the housewife stirs herself at daybreak until the fire goes out when they sleep. It should be stated in this connection, that they are supplied with a regular allowance of coal every year by the company, *gratis*, each family being entitled to a certain amount, which alone, if economically used, keeps them warm all winter in their new houses; but, for those who are extravagant and are itching to spend their extra wages, an extra supply is always kept in the storehouses of the company for sale. Their appreciation of and desire to possess all the canned fruit that is landed from the steamer, is marked to a great degree. If they had the opportunity, I doubt whether a single family on that island to-day would hesitate to bankrupt itself in purchasing this commodity. Potatoes they sometimes demand, as well as onions, and perhaps if these vegetables could be brought here and kept to an advantage, the people would soon become very fond of them. (See note, 39, G.)

OCCUPATION.—The question is naturally asked: How do these people employ themselves during the long nine months of every year after the close of the sealing season and until it begins again, when they have little or absolutely nothing to do? It may be answered, that they simply vegetate; or, in other words, are entirely idle, mentally and physically, during most of this period. But to their credit, let it be said, that mischief does not employ their idle hands; they are passive killers of time, drinking tea and sleeping, with a few disagreeable exceptions, such as the gamblers. There are a half-dozen of these characters at St. Paul, and perhaps as many at St. George, who pass whole nights at their sittings, even during the sealing season, playing games of cards, taught by Russians and persons who have been on the island since the transfer of the territory; but the majority of the men, women, and children, not being compelled to exert themselves to obtain any of the chief, or even the least, of the necessities of life, such as tea and hard bread, sleep the greater portion of the time, when not busy in eating, and in the daily observances of the routine belonging to the Greek Catholic church. The teachings, pomp, and circumstance of the religious observances of this faith alone preserve these people from absolute stagnation. In obedience to its teachings they gladly attend church very regularly. They also make and receive calls on their saints' days, and these days are very numerous. I think some 290 of the whole year's calendar must be given up to the ceremonies attendant upon the celebration of some holy man's or woman's birth or death.

In early times the same disgraceful beer-drinking orgies which prevailed to so great an extent, and still cause so much misery and confusion seen elsewhere in the territory, prevailed here, and I remember very well the difficulty which I had in initiating the first steps taken by the Treasury Department to suppress this abominable nuisance. During the last four or five years, it gives me pleasure to say, since the new order of things was inaugurated, the present agents of the department have faithfully executed the law.

The natives add to these entertainments of their saints' day and birth festivals, or “Emannimiks”, the music of accordions and violins; upon the former and its variation, the concertina, they play a number of airs, and are very fond of the noise. A great many of the women, in particular, can render indifferently a limited selection of tunes, many of which are the old battle-songs, so popular during the Rebellion, woven into weird Russian waltzes and love ditties, which they have jointly gathered from their former masters and our soldiers, who were quartered here in 1869. From the Russians and the troops, also, they have learned to dance various figures, and have been taught to waltz. These dances, however, the old folks do not enjoy very much. They will come in and sit around and look at the young performers with stolid indifference; but, if they manage to get a strong current of tea setting in their direction, nicely sugared and toned up, they revive and join in the mirth. In old times they never danced here unless they were drunk, and it was the principal occupation of the amiable and mischievous treasury agents, and others, in the early days to open up this beery fun. Happily, that nuisance is abated.

As an illustration of their working ability on the seal-grounds, I offer the following table, which shows the actual time occupied by them in finishing up the three seasons' work which I personally supervised:

On St. Paul island:

In 1872, 50 days' work of 71 men secured 75,000 seal-skins.

In 1873, 40 days' work of 71 men secured 75,000 seal-skins.

In 1874, 39 days' work of 84 men secured 90,000 seal-skins.

This exhibit plainly presents the increased ability and consequent celerity of action among the natives, and furnishes also at the same time abundant proof of the statement which I make, of the full and undiminished supply of killable seals, or “holluschickie”, from year to year.

THE INFLUENCE OF THE ALASKA COMMERCIAL COMPANY.—Before leaving the consideration of these people, who are so intimately associated with and blended into the business on these islands, it may be well to clearly define the relation existing between them, the government, and the company leasing the islands. When Congress granted to the Alaska Commercial Company of San Francisco the exclusive right of taking a certain number of fur-seals every year, for a period of twenty years on these islands, it did so with several reservations and conditions, which were

confided in their detail to the Secretary of the Treasury. This officer and the president of the Alaska Commercial Company agreed upon a code of regulations which should govern their joint action in regard to the natives. It was a simple agreement that these people should have a certain amount of dried salmon furnished them for food every year, a certain amount of fuel, a school-house, and the right to go to and come from the islands as they chose; and also the right to work or not, understanding that in case they did not work, their places would and could be supplied by other people who would work.

The company, however, has gone far beyond this exaction of the government; it has added the inexpressible boon of comfort, in the formation of the dwellings now occupied by the natives, which was not expressed nor thought of at the time of the granting of the lease. An enlightened business-policy suggested to the company, that it would be much better for the natives, and much better for the company too, if these people were taken out of their filthy, unwholesome hovels, put into habitable dwellings, and taught to live cleanly, for the simple reason that by so doing the natives, living in this improved condition, would be able physically and mentally, every season when the sealing work began, to come out from their long inanition and go to work at once with vigor and energetic persistency. The sequel has proved the wisdom of the company.

Before this action on their part, it was physically impossible for the inhabitants of St. Paul or St. George islands to take the lawful quota of 100,000 seal-skins annually in less than three or four working months. They take them in less than thirty working days now with the same number of men. What is the gain? Simply this, and it is everything: The fur-seal skin, from the 14th of June, when it first arrives, as a rule, up to the 1st of August, is in prime condition; from that latter date until the middle of October it is rapidly deteriorating, to slowly appreciate again in value as it sheds and renews its coat; so much so that it is practically worthless in the markets of the world. Hence, the catch taken by the Alaska Commercial Company every year is a prime one, first to last—there are no low-grade "stagey" skins in it; but under the old regimen, three-fourths of the skins were taken in August, in September, and even in October, and were not worth their transportation to London. Comment on this is unnecessary; it is the contrast made between a prescient business-policy, and one that was as shiftless and improvident as language can well devise.

SCHOOLS AND CHURCHES.—The company found so much difficulty in getting the youth of the villages to attend their schools, taught by our own people, especially brought up there and hired by the company, that they have adopted the plan of bringing one or two of the brightest boys down every year and putting them into our schools, so that they may grow up here and be educated, in order to return and serve as teachers there. This policy is warranted by the success attending the experiment made at the time when I was up there first, whereby a son of the chief was carried down and over to Rutland, Vermont, for his education, remained there four years, then returned and took charge of the school on St. Paul, which he has had ever since, with the happiest results in increased attendance and attention from the children. But, of course, so long as the Russian church service is conducted in the Russian language, we will find on the islands more Russian-speaking people than our own. The non-attendance at school was not and is not to be ascribed to indisposition on the part of the children and parents. One of the oldest and most intelligent of the natives told me, explanatory of their feeling and consequent action, that he did not, nor did his neighbors, have any objection to the attendance of their children on our English school; but, if their boys and young men neglected their Russian lessons, they knew not who were going to take their places, when they died, in his church, at the christenings, and at their burial? To any one familiar with the teachings of the Greek-Catholic faith, the objection of old Philip Volkov seems reasonable. I hope, therefore, that, in the course of time, the Russian church service may be voiced in English; not that I want to substitute any other religion for it—far from it; in my opinion it is the best one we could have for these people—but until this substitution of our language for the Russian is done, no very satisfactory work, in my opinion, will be accomplished in the way of an English education on the seal-islands.

The fact that among all the savage races found on the northwest coast by Christian pioneers and teachers, the Aleutians are the only practical converts to Christianity, goes far, in my opinion, to set them apart as very differently constituted in mind and disposition from our Indians and our Eskimos of Alaska. To the latter, however, they seem to be intimately allied, though they do not mingle in the slightest degree. They adopted the Christian faith with very little opposition, readily exchanging their barbarous customs and wild superstitions for the rites of the Greek-Catholic church and its more refined myths and legends.

At the time of their first discovery, they were living as savages in every sense of the word, bold and hardy, throughout the Aleutian chain, but now they respond, on these islands, to all outward signs of Christianity, as sincerely as our own church-going people.

6. THE ALASKA COMMERCIAL COMPANY.

OCCUPATION OF THE ISLANDS BY AMERICANS IN 1868.—The Alaska Commercial Company deserves and will receive a brief but comprehensive notice at this point. In order that we may follow it to these islands, and clearly and correctly appreciate the circumstances which gave it footing and finally the control of the business, I will pass back and review the chain of evidence adduced in this direction from the time of our first occupation, in 1867, of the territory of Alaska.

It will be remembered by many people, that when we were ratifying the negotiation between our government and that of Russia, it was made painfully apparent that nobody in this country knew anything about the subject of Russian America. Every schoolboy knew where it was located, but no professor or merchant, however wise or shrewd, knew what was in it. Accordingly, immediately after the purchase was made and the formal transfer effected, a large number of energetic and speculative men, some coming from New England even, but most of them residents of the Pacific coast, turned their attention to Alaska. They went up to Sitka in a little fleet of sail- and steam-vessels, but among their number it appears there were only two of our citizens who knew of or had the faintest appreciation as to the value of the seal-islands. One of these, Mr. H. M. Hutchinson, a native of New Hampshire, and the other a Captain Ebenezer Morgan, a native of Connecticut, turned their faces in 1868 toward them. Mr. Hutchinson gathered his information at Sitka—Captain Morgan had gained his years before by experience on the South Sea sealing grounds. Mr. Hutchinson represented a company of San Francisco or California capitalists when he landed on St. Paul; Captain Morgan represented another company of New London capitalists and whaling merchants. They arrived almost simultaneously, Morgan a few days or weeks anterior to Hutchinson. He had quietly enough commenced to survey and preempt the rookeries on the islands, or, in other words, the work of putting stakes down and recording the fact of claiming the ground, as miners do in the mountains; but later agreed to coöperate with Mr. Hutchinson. These two parties passed that season of 1868 in exclusive control of those islands, and they took an immense number of seals. They took so many that it occurred to Mr. Hutchinson unless something was done to check and protect these wonderful rookeries, which he saw here for the first time, and which filled him with amazement, that they would be wiped out by the end of another season; although he was the gainer then, and would be perhaps at the end, if they should be thus eliminated, yet he could not forbear saying to himself that it was wrong and should not be. To this Captain Morgan also assented.

ORGANIZATION OF THE ALASKA COMMERCIAL COMPANY.—In the fall of 1868 Mr. Hutchinson and Captain Morgan, by their personal efforts, interested and aroused the Treasury Department and Congress, so that a special resolution was enacted declaring the seal-islands a governmental reservation, and prohibiting any and all parties from taking seals thereon until further action by Congress. In 1869, seals were taken on those islands, under the direction of the Treasury Department, for the subsistence of the natives only; and in 1870 Congress passed the present law, a copy of which I append, for the protection of the fur-bearing animals on those islands, and under its provisions, and in accordance therewith, after an animated and bitter struggle in competition, the Alaska Commercial Company, of which Mr. Hutchinson was a prime organizer, secured the award and received the franchise which it now enjoys and will enjoy for another decade. The company is an American corporation, with a charter, rules, and regulations, which I reproduce in the appendix to this memoir. They employ a fleet of vessels, sail and steam: four steamers, a dozen or fifteen ships, barks, and sloops. Their principal occupation and attention is given naturally to the seal-islands, though they have stations scattered over the Aleutian islands and that portion of Alaska west and north of Kadiak. No post of theirs is less than 700 or 800 miles from Sitka.

Outside of the seal-islands all trade in this territory of Alaska is entirely open to the public. There is no need of protecting the fur-bearing animals elsewhere, unless it may be by a few wholesome general restrictions in regard to the sea-otter chase. The country itself protects the animals on the mainland and other islands by its rugged, forbidding, and inhospitable exterior.

The treasury officials on the seal-islands are charged with the careful observance of every act of the company; a copy of the lease and its covenant is conspicuously posted in their office; is translated into Russian, and is familiar to all the natives. The company directs its own labor, in accordance with the law, as it sees fit; selects its time of working, etc. The natives themselves work under the direction of their own chosen foremen, or "toyone". These chiefs call out the men at the break of every working-day, divide them into detachments according to the nature of the service, and order their doing. All communication with the laborers on the sealing-ground and the company passes through their hands; these chiefs having every day an understanding with the agent of the company as to his wishes, and they govern themselves thereby.

BUSINESS-METHODS.—The company pays 40 cents for the labor of taking each skin. The natives take the skins on the ground; each man tallying his work and giving the result at the close of the day to his chief or foreman. When the skins are brought up and counted into the salt-houses, where the agent of the company receives them from the hands of the natives, the two tallies usually correspond very closely, if they are not entirely alike. When the quota of skins is taken, at the close of two, three, or four weeks of labor, as the case may be, the total sum for the entire catch is paid over in a lump to the chiefs, and these men divide it among the laborers according to their standing as workmen, which they themselves have exhibited on their special tally-sticks. For instance, at the annual divisions, or "catch" settlement, made by the natives on St. Paul island among themselves, in 1872, when I was present, the proceeds of their work for that season in taking and skinning 75,000 seals, at 40 cents per skin, with extra work connected with it, making the sum of \$30,637 37, was divided among them in this way: There were 74 shares made up, representing 74 men, though in fact only 56 men worked, but they wished to give a certain proportion to their church, a certain proportion to their priest, and a certain proportion to their widows; so they water their stock, commercially speaking. The 74 shares were proportioned as follows:

37 first-class shares, at.....	\$451 22 each.
23 second-class shares, at.....	406 08 each.
4 third-class shares, at.....	360 97 each.
10 fourth-class shares, at.....	315 85 each.

These shares do not represent more than 56 able-bodied men.

In August, 1873, while on St. George island, I was present at a similar division, under similar circumstances, which caused them to divide among themselves the proceeds of their work in taking and skinning 25,000 seals, at 40 cents a skin, \$10,000. They made the following subdivision:

	Per share.
17 shares each, 961 skins	\$384 40
2 shares each, 935 skins	374 00
3 shares each, 821 skins	328 40
1 share each, 820 skins	328 00
3 shares each, 770 skins	308 00
3 shares each, 400 skins	160 00

These 29 shares referred to stated represent only 25 able-bodied men; two of them were women. This method of division as above given, is the result of their own choice. It is an impossible thing for the company to decide their relative merits as workmen on the ground, so they have wisely turned its entire discussion over to them. Whatever they do they must agree to—whatever the company might do they possibly and probably would never clearly understand, and hence dissatisfaction and suspicion would inevitably arise; as it is, the whole subject is most satisfactorily settled.

7. THE BUSINESS CONCERNED.

THE METHODS OF THE ALASKA COMMERCIAL COMPANY.—Living as the seal-islanders do, and doing what they do, the seal's life is naturally their great study and objective point. It nourishes and sustains them. Without it they say they could not live, and they tell the truth. Hence, their attention to the few simple requirements of the law, so wise in its provisions, is not forced or constrained, but is continuous. Self-interest in this respect appeals to them keenly and eloquently. They know everything that is done and everything that is said by anybody and by everybody in their little community. Every seal-drive that is made, and every skin that is taken, is recorded and accounted for by them to their chiefs and their church, when they make up their tithing-roll at the close of each day's labor. Nothing can come to the islands, by day or by night, without being seen by them and spoken of. I regard the presence of these people on the islands at the transfer, and their subsequent retention and entailment in connection with the seal-business, as an exceedingly good piece of fortune, alike advantageous to the government, to the company, and to themselves.

It will be remembered that, at the time the question of leasing the islands was before Congress, much opposition to the proposal was made, on several grounds, by two classes, one of which argued against a "monopoly", the other urging that the government itself would realize more by taking the whole management of the business into its own hands. At that time far away from Washington, in the Rocky mountains, I do not know what arguments were used in the committee-rooms, or who made them; but since my careful and prolonged study of the subject on the ground itself, and of the trade and its conditions, I am now satisfied that the act of June, 1870, directing the Secretary of the Treasury to lease the seal-islands of Alaska to the highest bidder, under the existing conditions and qualifications, did the best and the only correct and profitable thing that could have been done in the matter, both with regard to the preservation of the seal-life in its original integrity, and the pecuniary advantage of the treasury itself. To make this statement perfectly clear, the following facts, by way of illustration, should be presented:

First. When the government took possession of these interests, in 1868 and 1869, the gross value of a seal-skin laid down in the best market, at London, was less in some instances, and in others but slightly above the present tax and royalty paid upon it by the Alaska Commercial Company.

Second. Through the action of the intelligent business-men who took the contract from the government, in stimulating and encouraging the dressers of the raw material, and in taking sedulous care that nothing but good skins should leave the islands, and in combination with leaders of fashion abroad, the demand for the fur, by this manipulation and management, has been wonderfully increased.

Third. As matters now stand, the greatest and best interests of the lessees are identical with those of the government; what injures one instantly injures the other. In other words, both strive to guard against anything that shall interfere with the preservation of the seal-life in its original integrity, and both having it to their interest, if possible, to increase that life; if the lessees had it in their power, which they certainly have not, to ruin these interests by a few seasons of rapacity, they are so bonded and so environed that prudence prevents it.

Fourth. The frequent changes in the office of the Secretary of the Treasury, who has very properly the absolute control of the business as it stands, do not permit upon his part that close, careful scrutiny which is exercised by the lessees, who, unlike him, have but their one purpose to carry out. The character of the leading men among them is enough to assure the public that the business is in responsible hands, and in the care of persons who will use every effort for its preservation and its perpetuation, as it is so plainly their best end to serve. Another great obstacle to the success of the business, if controlled entirely by the government, would be encountered in disposing

of the skins after they had been brought down from the islands. It would not do to sell them up there to the highest bidder, since that would license the sailing of a thousand ships to be present at the sale. The rattling of their anchor-chains, and the scraping of their keels on the beaches of the two little islands, would alone drive every seal away and over to the Russian grounds in a remarkably short space of time. The government would therefore need to offer them at public auction in this country, and it would be simply history repeating itself—the government would be at the mercy of any well-organized combination of buyers. The agents conducting the sale could not counteract the effect of such a combination as can the agents of a private corporation, who may look after their interest in all the markets of the world in their own time and in their own way, according to the exigencies of the season and the demand, and who are supplied with money which they can use, without public scandal, in the manipulation of the market. On this ground I feel confident in stating, that the treasury of the United States receives more money, net, under the system now in operation, than it would by taking the exclusive control of the business. Were any capable government officer supplied with, say, \$100,000, to expend in "working the market", and intrusted with the disposal of 100,000 seal-skins wherever he could do so to the best advantage of the government, and were this agent a man of first-class business ability and energy, I think it quite likely that the same success might attend his labor in the London market that distinguishes the management of the Alaska Commercial Company. But imagine the cry of fraud and embezzlement that would be raised against him, however honest he might be! This alone would bring the whole business into positive disrepute, and make it a national scandal. As matters are now conducted, there is no room for any scandal—not one single transaction on the islands but what is as clear to investigation and accountability as the light of the noon-day sun; what is done is known to everybody, and the tax now laid by the government upon, and paid into the treasury every year by the Alaska Commercial Company, yields alone a handsome rate of interest on the entire purchase-money expended for the ownership of all Alaska.

It is frequently urged with great persistency, by misinformed or malicious authority, that the lessees can and do take thousands of skins in excess of the law, and this catch in excess is shipped *sub rosa* to Japan from the Pribylov islands. To show the folly of such a move on the part of the company, if even it were possible, I will briefly recapitulate the conditions under which the skins are taken. The natives of St. Paul and St. George do themselves, in the manner I have indicated, all the driving and skinning of the seals for the company. No others are permitted or asked to land upon the islands to do this work, so long as the inhabitants of the islands are equal to it. They have been equal to it and they are more than equal to it. Every skin taken by the natives is counted by themselves, as they get 40 cents per pelt for that labor; and at the expiration of each day's work in the field, the natives know exactly how many skins have been taken by them, how many of these skins have been rejected by the company's agent because they were carelessly cut and damaged in skinning—usually about three-fourths of one per cent. of the whole catch—and they have it recorded every evening by those among them who are charged with the duty. Thus, were 101,000 skins taken, instead of 100,000 allowed by law, the natives would know it as quickly as it was done, and they would, on the strength of their record and their tally, demand the full amount of their compensation for the extra labor; and were any ship to approach the islands, at any hour, these people would know it at once, and would be aware of any shipment of skins that might be attempted. It would then be the common talk among the 398 inhabitants of the two islands, and it would be a matter of record, open to any person who might come upon the ground charged with investigation. (See note, 39, L.)

Furthermore, these natives are constantly going to and from Oonalashka, visiting their relations in the Aleutian settlements, hunting for wives, etc. On the mainland they have intimate intercourse with bitter enemies of the company, with whom they would not hesitate to talk over the whole state of affairs on the islands, as they always do; for they know nothing else and think of nothing else and dream of nothing else. Therefore, should anything be done contrary to the law, the act could and would be reported by these people. The government, on its part, through its four agents stationed on these islands, counts these skins into the ship, and one of their number goes down to San Francisco upon her. There the collector of the port details experts of his own, who again count them all out of the hold, and upon that record the tax is paid and the certificate signed by the government.

It will, therefore, at once be seen, by examining the state of affairs on the islands, and the conditions upon which the lease is granted, that the most scrupulous care in fulfilling the terms of the contract is compassed, and that this strict fulfillment is the most profitable course for the lessees to pursue; and that it would be downright folly in them to deviate from the letter of the law, and thus lay themselves open at any day to discovery, the loss of their contract, and forfeiture of their bonds. Their action can be investigated at any time, any moment, by Congress; of which they are fully aware. They cannot bribe these 398 people on the islands to secrecy, any more successfully than they could conceal their action from them on the sealing fields; and any man of average ability could go, and can go, among these natives and inform himself as to the most minute details of the catch, from the time the lease was granted up to the present hour, should he have reason to suspect the honesty of the treasury agents. The road to and from the islands is not a difficult one, though it is traveled only once a year.

The subject of the method and direction of the business of sealing on these islands, involving as it does a discussion of the law and the action of the Alaska Commercial Company and the natives combined, will form a thesis for another chapter.

E. THE SEAL-LIFE ON THE PRIBYLOV ISLANDS.

8. THE HAIR-SEAL.

ENUMERATION OF THE VARIOUS SPECIES OF SEALS.—The history of the fur-seal, the one overshadowing and superlatively interesting subject of this discussion, I shall present in all its multitudinous details, even at the risk of being thought tedious. The aggregate of animal life shadowed every summer out upon the breeding grounds of the seal-islands is so vast, so anomalous, so interesting, and so valuable, that it deserves the fullest mention; and even when I shall have done, it will be but feebly expressed.

The seal-life on the Pribylov islands may be classified under the following heads, namely: (1) The fur-seal, *Callorhinus ursinus*, the "kautickie" of the Russians; (2) the sea-lion, *Eumetopias Stelleri*, the "seevitchie" of the Russians; (3) the hair-seal, *Phoca vitulina*, the "nearhpahsky" of the Russians; (4) the walrus, *Odobenus obsesus*, the "morsjee" of the Russians.

THE HAIR-SEAL.—The above short schedule embraces the titles of all the pinnipeds found in, on, and around the island group. Of this list the hair-seal is the animal which has done so much to found that erroneous, popular, and scientific opinion as to what a fur-seal appears like. *Phoca vitulina* has, in this manner, given to the people of the world a false idea of its relatives. It is so commonly distributed all over the littoral salt waters of the earth, seen in the harbors of nearly every marine port, or basking along the loneliest and least inhabited of desolate coasts far to the north, that everybody has noticed it, if not in life, then in its stuffed skins at the museums, sometimes very grotesquely stuffed. This copy, set everywhere before the eye of the naturalist, has rendered it so difficult for him to correctly discriminate between the *Phocidae* and the *Otariidae*, that the synonymy of the *Pinnipedia* has been expanded until it is replete with meaningless description and surmise.

Although the hair-seal belongs to the great group of pinnipeds, yet it does not have even a generic affinity with those seals with which it has been so persistently grouped, namely, the fur-seal and the sea-lion. It no more resembles them, than does the raccoon the black or grizzly bear.

I shall not enter into a detailed description of this seal; it is wholly superfluous, for excellent, and, I believe, trustworthy accounts have been repeatedly published by writers* who have treated of the subject as it was spread before their eyes on the coasts of Labrador, Newfoundland, and Greenland; to say nothing of the researches and notes made by European scientists. It differs completely in shape and habit from its congeners on these islands. Here, where I have studied its biology, it seldom comes up from the water more than a few rods at the farthest; generally hauling and resting at the margin of the surf-wash. It takes up no position on land to hold and protect a family or harem, preferring the detached water-worn rocks, especially those on the lonely north shore of St. Paul, although I have seen it resting at "Gorbotch", near the sea-margin of the great seal-rookery of that name, on the Reef point of St. Paul; its cylindrical, supine, gray and white body marked in strong contrast with the erect, black and ochre-colored forms of the *Callorhinus*, which swarmed around about it. On such small spots of rock, wet and isolated from the mainland, and in secluded places on the north shore, the "Nearhpah" brings forth its young, a single pup, perfectly white, covered with long woolly hair, and weighing from 3 to 7 pounds. This pup grows rapidly, and after the lapse of four or five months it tips the scales at 50 pounds; by that time it has shed its infant coat and donned the adult soft steel-gray hair over the head, limbs, and abdomen, with the back most richly mottled and barred lengthwise, by dark brown and brown-black streaks and blotches, suffused at their edges into the light steel-gray ground of the body. When they appear in the spring following, this bright gray tone to their color has ripened into a dingy ochre, and the mottling spread well over the head and down on the upper side or back of the flippers, but fades out as it progresses. It has no appreciable fur or under-wool. There is no noteworthy difference as to color or size between the sexes. So far as I have observed, they are not polygamous. They are exceedingly timid and wary at all times, and in this manner and method they are diametrically opposed, not by shape alone, but by habit and disposition, to the fashion of the fur-seal in especial, and the sea-lion. Their skin is of little value, comparatively, but their chief merit, according to the natives, is the relative greater juiciness and sweetness of their flesh, over even the best steaks of sea-lion or fur-seal pup meat.

One common point of agreement among all authors was, by my observations of fact, so strikingly refuted, that I will here correct a prevalent error made by naturalists who, comparing the hair-seal with the fur-seal, state that in consequence of the peculiar structure of their limbs, their progression on land is "mainly accomplished by a wriggling, serpentine motion of the body, slightly assisted by the extremities". This is not so in any respect; for whenever I have purposely surprised these animals, a few rods from the beach-margin, they would awake and excitedly scramble, or rather spasmodically exert themselves, to reach the water instantly, by striking out quickly with both fore-feet simultaneously, lifting in this way alone, and dragging the whole body forward, without any "wriggling motion" whatever to their back or posterior parts, moving from six inches to a foot in advance every time their fore-feet were projected forward, and the body drawn along according to the violence of the effort and the character of the ground; the body of the seal then falls flat upon its stomach, and the fore-feet or flippers are

* A very complete résumé has been given by Allen, *Hist. North American Pinnipeds*, 1880.

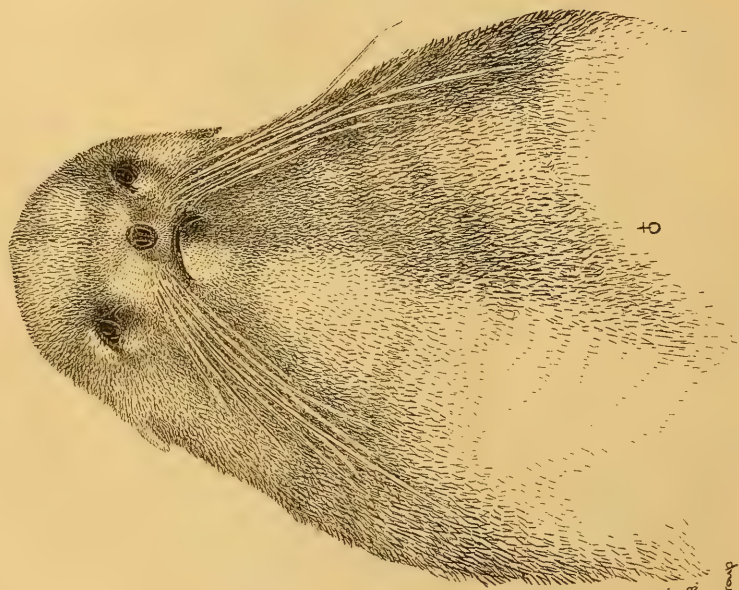


THE HAIR-SEAL.

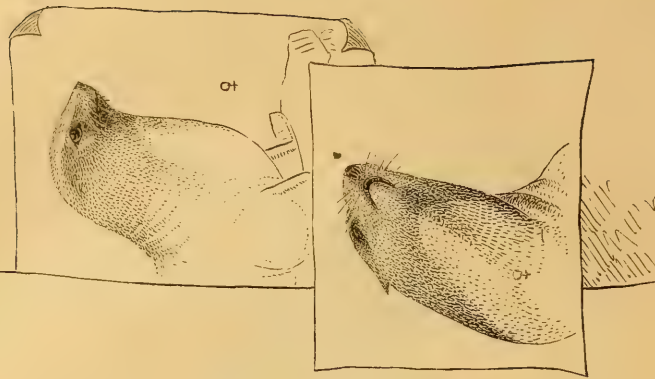
(*Phoca vitulina*: male, female, and young.)

A life-study by the author: Zapadnié, St. Paul Island, June 20, 1872.

Callorhinus, Rex.



W. H. Scott
Seal Island
Montgomery, Cal.
K. A. G. Group



THE COUNTENANCE OF THE FUR-SEAL.

Life-studies of *Callorhinus* by the author.

(Full face of old male; profile and under-view of female.)

free again for another similar motion. This action of *Phoca* is effected so continuously and so rapidly, that in attempting to head off a young "Nearhpal" from the water, at English bay, I was obliged to leave a brisk walk and take to a dog trot to do it. The hind-feet are not used when exerted in this rapid movement at all; they are dragged along in the wake of the body, perfectly limp and motionless. But they do use those posterior parts, however, when leisurely climbing up and over rocks undisturbed, or playing one with another; still it is always a weak, trembling terrestrial effort, and particularly impotent and clumsy. In their swift swimming the hind-feet of *Phocidæ* evidently do all the work; the reverse is the characteristic of the *Otaridæ*.

These remarks of mine, it should be borne in mind, apply directly to *Phoca vitulina*, and I presume indirectly with equal force to all the rest of its more important generic kindred, be they as large as *Phoca barbata* or less.

This hair-seal is found around these islands at all seasons of the year, but in very small numbers. I have never seen more than twenty-five or thirty at any one time, and I am told that its occidental distribution, although everywhere found, above and below, from the arctic to the tropics, and especially general over the North Pacific coast, nowhere exhibits any great number at any one place; but we know that it and its immediate kindred form a vast majority of the multitudinous seal-life peculiar to our North Atlantic shores, ice floes, and contiguous waters. The scarcity of this species, and of all its generic allies, in the waters of the Pacific, is notable as compared with those of the circumpolar Atlantic, where these hair-seals are the seals of commerce, and are found in such immense numbers between Greenland and Labrador, and thence to the eastward at certain seasons* of every year, that employment is given to a fleet of about sixty sailing and steam vessels, which annually go forth† from St. John, Newfoundland, and elsewhere, fitted for seal-fishing, taking in all their voyages over 300,000 of these animals each season; the principal object of value, however, is the oil rendered from them, the skins having very small commercial importance.‡ Touching oil, etc., a business digest of this subject, as it refers to the seal-islands of Alaska, will be found in this memoir, in that portion descriptive of the methods employed by working the hauling-grounds of the "holluschickie".

9. LIFE-HISTORY OF THE FUR-SEAL.

DESCRIPTION OF AN ADULT MALE.—The fur-seal, *Callorhinus ursinus*, which repairs to these islands to breed and to shed its hair and fur, in numbers that seem almost fabulous, is the highest organized of all the *Pinnipedia*, and, indeed, for that matter, when land and water are weighed in the account together, there is no other animal known to man which can be truly, as it is, classed superior, from a purely physical point of view. Certainly there are few, if any, creatures in the animal kingdom that can be said to exhibit a higher order of instinct, approaching even our intelligence.

I wish to draw attention to a specimen of the finest of this race—a male in the flush and prime of his first maturity, six or seven years old, and full grown. When it comes up from the sea early in the spring, out to its station for the breeding season, we have an animal before us that will measure 6½ to 7½ feet in length from tip of nose to the end of its abbreviated, abortive tail. It will weigh at least 400 pounds, and I have seen older specimens much more corpulent, which, in my best judgment, could not be less than 600 pounds in weight. The head of this animal now before us, appears to be disproportionately small in comparison with the immensely thick neck and shoulders; but, as we come to examine it we will find it is mostly all occupied by the brain. The light frame-work of the skull supports an expressive pair of large bluish hazel eyes; alternately burning with revengeful, passionate light, then suddenly changing to the tones of tenderness and good nature. It has a muzzle and jaws of about the same size and form observed in any full-blooded Newfoundland dog, with this difference, that the lips are not flabby and overhanging; they are as firmly lined and pressed against one another as our own. The upper lips support a yellowish white and gray moustache, composed of long, stiff bristles, and when it is not torn out and broken off in combat, it sweeps down and over the shoulders as a luxuriant plume. Look at it as it comes leisurely swimming on toward the land; see how high above the water it carries its head, and how deliberately it surveys the beach, after having stepped upon it (for it may be truly said to step with its fore-flippers, as they regularly alternate when it moves up), carrying the head well above them, erect and graceful, at least three feet

* March and April. †Sailing on the 10th of March, simultaneously: the Canadian law prohibits earlier work in this respect.

‡An excellent, and, as far as I know, a correct description of this seal-fishery in the North Atlantic has been published by Michael Carroll, in his *Seal and Herring Fisheries of Newfoundland*. This gentleman writes in a manner indicative of much familiarity with the business, though it is to be regretted that his observations were not more systematized and concentrated. Mr. Carroll, when he published his work in 1873, had enjoyed a personal experience of over fifty years in the hair-seal hunting of the North Atlantic, and this report is, therefore, perhaps the best exposition of the habit and condition of those *Phocidæ* that is extant; at least I should judge so. Robert Brown, in 1863 (Proc. Zool. Society, London, pp. 413-418), gives a graphic sketch of the life of the Greenland hair-seal, while Ludwig Kummlein, in "Bulletin No. 15" of the United States National Museum, 1879, presents altogether the most interesting and valuable biology of the hair-seals in the waters of Cumberland sound that has as yet been printed. Allen, in his *History of the North American Pinnipeds*, 1880, has, with painstaking labor, carefully compiled the pertinent remarks of a whole army of lesser authorities upon the doing and well-being of the *Phocidæ*, and has arranged them in his memoir so that they appear to the best advantage. Carroll's report is exceedingly interesting, and could he be induced to rewrite his notes, systematising them, or permit some naturalist to do so who might draw out from him information on important points, now hidden, the result undoubtedly would accrue greatly to the benefit of all concerned, and cause him to reap a fitting recognition of his knowledge of the subject, which seems to be very full and exhaustive, as far as expressed by himself.

from the ground. The fore-feet, or flippers, are a pair of dark bluish-black hands, about 8 or 10 inches broad at their junction with the body, and the metacarpal joint, running out to an ovate point at their extremity, some 15 to 18 inches from this union; all the rest of the forearm, the ulna, radius, and humerus being concealed under the skin and thick blubber-folds of the main body and neck, hidden entirely at this season, when it is so fat. But six weeks to three months after this time of landing, when that superfluous fat and flesh has been consumed by self-absorption, those bones show plainly under the shrunken skin. On the upper side of these flippers the hair of the body straggles down finer and fainter as it comes below to a point close by, and slightly beyond that spot of junction where the phalanges and the metacarpal bones unite, similar to that point on our own hand where our knuckles are placed; and here the hair ends, leaving the rest of the skin to the end of the flipper bare and wrinkled in places at the margin of the inner side; showing, also, fine small pits, containing abortive nails, which are situated immediately over the union of the phalanges with their cartilaginous continuations to the end of the flipper.

On the under side of the flipper the skin is entirely bare, from its outer extremity up to the body connection; it is sensibly tougher and thicker than elsewhere on the body; it is deeply and regularly wrinkled with seams and furrows, which cross one another so as to leave a kind of sharp diamond-cut pattern. When they are placed by the animal upon the smoothest rocks, shuining and slippery from algaoid growths and the sea-polish of restless waters, they seldom fail to adhere.

When we observe this seal moving out on the land, we notice that, though it handles its fore-feet in a most creditable manner, it brings up its rear in quite a different style; for, after every second step ahead with the anterior limbs, it will arch its spine, and in arching, it drags and lifts up, and together forward, the hind-feet, to a fit position under its body, giving it in this manner fresh leverage for another movement forward by the fore-feet, in which the spine is again straightened out, and then a fresh hitch is taken up on the posteriors once more, and so on as the seal progresses. This is the leisurely and natural movement on land, when not disturbed, the body all the time being carried clear of and never touching the ground. But if the creature is frightened, this method of progression is radically changed. It launches into a lope, and actually gallops so fast that the best powers of a man in running are taxed to head it off. Still, it must be remembered that it cannot run far before it sinks trembling, gasping, breathless, to the earth; thirty or forty yards of such speed marks the utmost limit of its endurance.

The radical difference in the form and action of the hind-feet cannot fail to strike the eye at once; they are one-seventh longer than the fore-hands, and very much lighter and more slender; they resemble, in broad terms, a pair of black kid gloves, flattened out and shriveled, as they lie in their box.

There is no suggestion of fingers on the fore-hands; but the hind-feet seem to be toes run into ribbons, for they literally flap about involuntarily from that point, where the cartilaginous processes unite with the phalangeal bones. The hind-feet are also merged in the body at their junction with it, like those anterior; nothing can be seen of the leg above the tarsal joint.

The shape of the hind-flipper is strikingly like that of a human foot, provided the latter were drawn out to a length of 20 or 22 inches, the instep flattened down, and the toes run out into thin, membranous, oval-tipped points, only skin-thick, leaving three strong, cylindrical, grayish, horn-colored nails, half an inch long each, back six inches from these skinny toe-ends, without any sign of nails to mention on the outer big and little toes.

On the upper side of this hind-foot the body-hair comes down to that point where the metatarsus and phalangeal bones join and fade out. From this junction the phalanges, about six inches down to the nails above mentioned, are entirely bare, and stand ribbed up in bold relief on the membrane which unites them, as the web to a duck's foot; the nails just referred to mark the ends of the phalangeal bones, and their union in turn with the cartilaginous processes, which run rapidly tapering and flattening out to the ends of the thin toe-points. Now, as we are looking at this fur-seal's motion and progression, that which seems most odd, is the gingerly manner (if I may be allowed to use the expression) in which it carries these hind-flippers; they are held out at right angles from the body directly opposite the pelvis, the toe-ends or flaps slightly waving, curled, and drooping over, supported daintily, as it were, above the earth, the animal only suffering its weight behind to fall upon its heels, which are themselves opposed to each other, scarcely five inches apart.

We shall, as we see this seal again later in the season, have to notice a different mode of progression and bearing, both when it is lording over its harem, or when it grows shy and restless at the end of the breeding season, then faint, emaciated, and dejected; but we will now proceed to observe him in the order of his arrival and that of his family. His behavior during the long period of fasting and unceasing activity and vigilance, and other cares which devolve upon him as the most eminent of all polygamists in the brute world, I shall carefully relate; and to fully comprehend the method of this exceedingly interesting animal, it will be frequently necessary for the reader to refer to my sketch-maps of its breeding-grounds or rookeries, and the islands.

ARRIVAL AT THE SEAL-GROUNDS: COMING IN OF THE BULLS.—The adult males are the first examples of the *Callorhinus* to arrive in the spring on the seal-ground, which has been deserted by all of them since the close of the preceding year.

Between the 1st and 5th of May, usually, a few males will be found scattered over the rookeries, pretty close to the water. They are, at this time, quite shy and sensitive, seeming not yet satisfied with the land; and a great many

spend day after day idly swimming out among the breakers, a little distance from the shore, before they come to it, perhaps somewhat reluctant at first to enter upon the assiduous duties and the grave responsibilities before them in fighting for and maintaining their positions in the rookeries.

The first arrivals are not always the oldest bulls, but may be said to be the finest and most ambitious of their class. They are full grown and able to hold their places on the rookeries or the breeding-flats, which they immediately take up after coming ashore. Their method of landing is to come collectively to those breeding-grounds where they passed the prior season; but I am not able to say authoritatively, nor do I believe it, strongly as it has been urged by many careful men who were with me on the islands, that these animals come back to and take up the same position on their breeding-grounds that they individually occupied when there last year. From my knowledge of their action and habit, and from what I have learned of the natives, I should say that very few, if any, of them make such a selection and keep these places year after year. Even did the seal itself intend to come directly from the sea to that spot on the rookery which it left last summer, what could it do if it came to that rookery-margin a little late, and found that another "see-catch" had occupied its ground? The bull could do nothing. It would either have to die in its tracks, if it persisted in attaining this supposed objective point, or do what undoubtedly it does do—seek the next best locality which it can attain adjacent.

One old "see-catch" was pointed out to me at the "Gorbatch" section of the Reef rookery, as an animal that was long known to the natives as a regular visitor, close by or on the same rock, every season during the past three years. They called him "Old John", and they said they knew him because he had one of his posterior digits missing, bitten off, perhaps, in a combat. I saw him in 1872, and made careful drawings of him in order that I might recognize his individuality, should he appear again in the following year, and when that time rolled by I found him not; he failed to reappear, and the natives acquiesced in his absence. Of course it was impossible to say that he was dead, when there were 10,000 rousing, fighting bulls to the right, left, and below us, under our eyes, for we could not approach for inspection. Still, if these animals came each to a certain place in any general fashion, or as a rule, I think there would be no difficulty in recognizing the fact; the natives certainly would do so; as it is, they do not. I think it very likely, however, that the older bulls come back to the same common rookery-ground where they spent the previous season; but they are obliged to take up their position on it just as the circumstances attending their arrival will permit, such as finding other seals which have arrived before them, or of being whipped out by stronger rivals from their old stands.

It is entertaining to note, in this connection, that the Russians themselves, with the object of testing this mooted query, during the later years of their possession of the islands, drove up a number of young males from Lukannon, cut off their ears, and turned them out to sea again. The following season, when the drives came in from the "hauling-grounds" to the slaughtering-fields, quite a number of those cropped seals were in the drives, but instead of being found all at one place—the place from whence they were driven the year before—they were scattered examples of croppies from every point on the island. The same experiment was again made by our people in 1870 (the natives having told them of this prior undertaking), and they went also to Lukannon, drove up 100 young males, cut off their left ears, and set them free in turn. Of this number, during the summer of 1872, when I was there, the natives found in their driving of 75,000 seals from the different hauling-grounds of St. Paul up to the village killing-grounds, two on Novastoshnah rookery, 10 miles north of Lukannon, and two or three from English bay and Tolstoi rookeries, 6 miles west by water; one or two were taken on St. George island, 36 miles to the southeast, and not one from Lukannon was found among those that were driven from there; probably, had all the young males on the two islands this season been examined, the rest of the croppies that had returned from the perils of the deep, whence they sojourned during the winter, would have been distributed quite equally about the Pribylov hauling-grounds. Although the natives say that they think the cutting off of the animal's ear gives the water such access to its head as to cause its death, yet I noticed that those examples which we had recognized by this auricular mutilation, were normally fat and well developed. Their theory does not appeal to my belief, and it certainly requires confirmation.

These experiments would tend to prove very cogently and conclusively, that when the seals approach the islands in the spring, they have nothing in their minds but a general instinctive appreciation of the fitness of the land, as a whole; and no special fondness or determination to select any one particular spot, not even the place of their birth. A study of my map of the distribution of the seal-life on St. Paul, clearly indicates that the landing of the seals on the respective rookeries is influenced greatly by the direction of the wind at the time of their approach to the islands in the spring and early summer. The prevailing airs, blowing, as they do at that season, from the north and northwest, carry far out to sea the odor of the old rookery-flats, together with the fresh scent of the pioneer bulls which have located themselves on these breeding-grounds, three or four weeks in advance of their kind. The seals come up from the great North Pacific, and hence it will be seen that the rookeries of the south and southeastern shores of St. Paul island receive nearly all the seal-life, although there are miles of perfectly eligible ground at Nahsayvernia, or north shore. To settle this matter beyond all argument, however, I know is an exceedingly difficult task, for the identification of individuals, from one season to another, among the hundreds of thousands, and even millions, that come under the eye on one of these great rookeries, is well nigh impossible.

From the time of the first arrival in May up to the beginning of June, or as late as the middle of that month, if the weather be clear, is an interval in which everything seems quiet. Very few seals are added to the pioneers that have landed, as we have described. By the 1st of June, however, sometimes a little before, and never much later, the seal-weather—the foggy, humid, oozy damp of summer—sets in; and with it, as the gray banks roll up and shroud the islands, the bull-seals swarm from the depths by hundreds and thousands, and locate themselves in advantageous positions for the reception of the females, which are generally three weeks or a month later than this date in arrival.

PRE-EMPTION OF THE ROOKERIES: BATTLES OF THE SEALS.—The labor of locating and maintaining a position on the rookery is really a terribly serious business for these bulls which come in last; and it is so all the time to those males that occupy the water-line of the breeding-grounds. A constantly-sustained fight between the newcomers and the occupants goes on morning, noon, and night, without cessation, frequently resulting in death to one or even both of the combatants.

It appears, from my survey of these breeding-grounds, that a well-understood principle exists among the able-bodied bulls, to wit: that each one shall remain undisturbed on his ground, which is usually about six to eight feet square; provided that at the start, and from that time until the arrival of the females, he is strong enough to hold this ground against all comers; inasmuch as the crowding in of the fresh arrivals often causes the removal of those which, though equally able-bodied at first, have exhausted themselves by fighting earlier and constantly; they are finally driven by these fresher animals back farther and higher up on the rookery; and sometimes off altogether.

Many of those bulls exhibit wonderful strength and desperate courage. I marked one veteran at Gorbateh, who was the first to take up his position early in May, and that position, as usual, directly at the water-line. This male seal had fought at least forty or fifty desperate battles, and fought off his assailants every time—perhaps nearly as many different seals which coveted his position—and when the fighting season was over (after the cows were mostly all hauled up), I saw him still there, covered with scars and frightfully gashed; raw, festering, and bloody, one eye gouged out, but lordling it bravely over his harem of fifteen or twenty females, who were all huddled together on the same spot of his first location and around him.

This fighting between the old and adult males (for none others fight) is mostly, or rather entirely, done with the mouth. The opponents seize one another with their teeth, and, then clenching their jaws, nothing but the sheer strength of the one and the other tugging to escape can shake them loose, and that effort invariably leaves an ugly wound, the sharp canines tearing out deep gutters in the skin and furrows in the blubber, or shredding the flippers into ribbon-strips.

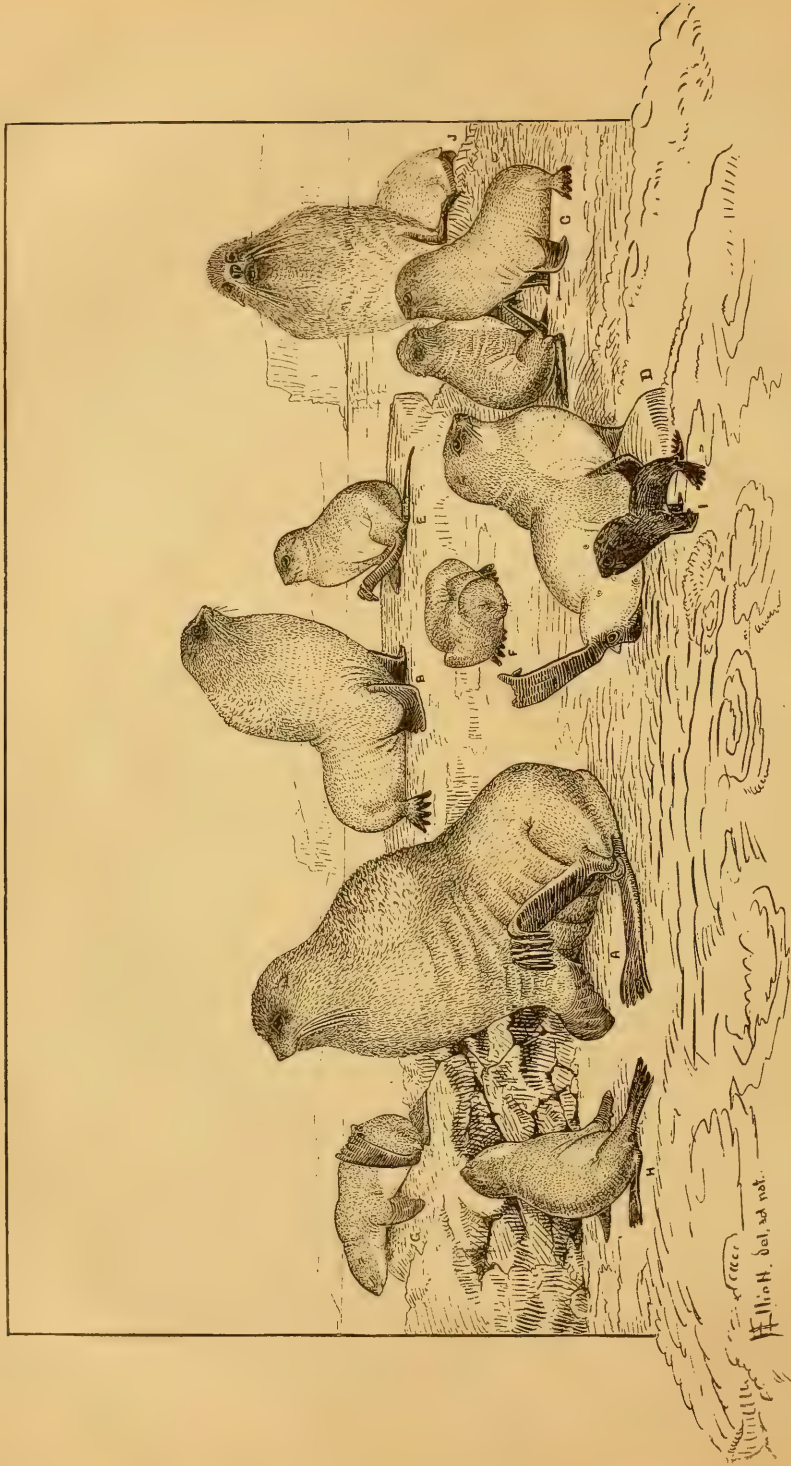
They usually approach each other with comically averted heads, just as though they were ashamed of the rumpus which they are determined to precipitate. When they get near enough to reach one another they enter upon the repetition of many feints or passes, before either one or the other takes the initiative by gripping. The heads are darted out and back as quick as a flash; their hoarse roaring and shrill, piping whistle never ceases, while their fat bodies writhe and swell with exertion and rage; furious lights gleam in their eyes; their hair flies in the air, and their blood streams down; all combined, makes a picture so fierce and so strange that, from its unexpected position and its novelty, is perhaps one of the most extraordinary brutal contests man can witness.

In these battles of the seals, the parties are always distinct; the one is offensive, the other defensive. If the latter proves the weaker he withdraws from the position occupied, and is never followed by his conqueror, who complacently throws up one of his hind-flippers, fans himself, as it were, to cool his fevered wrath and blood from the heat of the conflict, sinks into comparative quiet, only uttering a peculiar chuckle of satisfaction or contempt, with a sharp eye open for the next covetous bull or "see catch".*

ATTITUDES AND COLORATION OF THE FUR-SEALS.—The period occupied by the males in taking and holding their positions on the rookery, offers a very favorable opportunity to study them in the thousand and one different attitudes and postures assumed, between the two extremes of desperate conflict and deep sleep—sleep so profound that one can, if he keeps to the leeward, approach close enough, stepping softly, to pull the whiskers of any old male taking a nap on a clear place; but after the first touch to these moustaches, the trifle must jump with electrical celerity back, if he has any regard for the sharp teeth and tremendous shaking which will surely overtake him if he does not. The younger seals sleep far more soundly than the old ones, and it is a favorite pastime for the natives to surprise them in this manner—favorite, because it is attended with no personal risk; the little beasts, those amphibious sleepers, rise suddenly, and fairly shrink to the earth, spitting and coughing their terror and confusion.

The neck, chest, and shoulders of a fur-seal bull comprise more than two-thirds of his whole weight; and in this long, thick neck, and the powerful muscles of the fore-limbs and shoulders, is embodied the larger portion of his strength. When on land, with the fore-hands he does all climbing over the rocks and grassy hummocks back of the rookery, or shuffles his way over the smooth parades; the hind-feet being gathered up as useless trappings after every second step forward, which we have described at the outset of this chapter. These anterior flippers are

* "See-catch," native name for the bulls on the rookeries, especially those which are able to maintain their position.



THE FUR-SEAL.

(*Callorhinus ursinus*.)

- A. Old "Seacatch," or male, 8 to 24 years.
- B. Young "Seacatch," 4 to 8 years.
- C. "Holluchickie," or young males, 2 years.

- D. "Matkah," or cow nursing her "pup," I.
- E. Cow fanning herself.
- F. Cow sleeping.
- G. Cow napping and fanning herself.
- H. Cow crooning to the male.
- J. Characteristic twisting of bodies of old males.

Life-studies by the author: Fribylov Islands, 1872-'76.

also the propelling power when in water, the exclusive machinery with which they drive their rapid passage; the hinder ones, floating behind like the steering sweep of a whale-boat, used evidently as rudders, or as the tail of a bird is, while its wings sustain and force its rapid flight.

The covering to the body is composed of two coats, one being a short, crisp, glistening over-hair; and the other a close, soft, elastic pelage, or fur, which gives the distinctive value to the pelt. I can call it readily to the mind of my readers, when I say to them that the down and feathers on the breast of a duck lay relatively as the fur and hair do upon the skin of the seal.

At this season of first "hauling up,"* in the spring, the prevailing color of the bulls, after they dry off and have been exposed to the weather, is a dark, dull brown, with a sprinkling in it of lighter brown-black, and a number of hoary or grizzly gray coats peculiar to the very old males. On the shoulders of all of them, that is, the adults, the over-hair is either a gray or rufous ocher, or a very emphatic "pepper and salt"; this is called the "wig". The body-colors are most intense and pronounced upon the back of the head, neck, and spine, fading down on the flanks lighter, to much lighter ground on the abdomen; still never white or even a clean gray, so beautiful and peculiar to them when young, and to the females. The skin of the muzzle and flippers is a dark bluish-black, fading in the older examples to a reddish and purplish tint. The color of the ears and tail is similar to that of the body, perhaps a trifle lighter; the ears on a bull fur-seal are from one inch to an inch and a half in length; the pavilions or auricles are tightly rolled up on themselves, so that they are similar in shape to, and exactly the size of, the little finger on the human hand, cut off at the second phalangeal joint, a trifle more cone-shaped, however, as they are greater at the base than they are at the tip. They are haired and furred as the body is.

I think it probable that this animal has and does exert the power of compressing or dilating this scroll-like pavilion to its ear, just according as it dives deeper or rises in the water; and also, I am quite sure that the hair-seal has this control over the *meatus externus*, from what I have seen of it. I have not been able to verify it in either case by actual observation: yet such opportunity as I have had gives me undoubted proof of the fact, that the hearing of the fur-seal is wonderfully keen and surpassingly acute. If you make any noise, no matter how slight, the alarm will be given instantly by these insignificant-looking auditors, and the animal, awaking from profound sleep, assumes, with a single motion, an erect posture, gives a stare of stupid astonishment, at the same time breaking out into incessant, surly roaring, growling, and "spitting".

VOICE OF THE FUR-SEAL.—This spitting, as I call it, is by no means a fair or full expression of the most characteristic sound or action, so far as I have observed, peculiar to the fur-seals alone, the bulls in particular. It is the usual prelude to all their combats, and it is their signal of astonishment. It follows somewhat in this way: when the two disputants are nearly within reaching or striking distance, they make a number of feints or false passes, as fencing-masters do, at one another, with the mouth wide open, lifting the lips or snarling so as to exhibit the glistening teeth, and with each pass of the head and neck they expel the air so violently through the larynx, as to make a rapid *choo-choo-choo* sound, like steam-puffs as they escape from the smoke-stack of a locomotive when it starts a heavy train, especially while the driving-wheels slip on the rail.

All of the bulls have the power and frequent inclination to utter four distinct calls or notes. This is not the case with the sea-lion,† whose voice is confined to a single bass roar, or that of the walrus, which is limited to a dull grunt, or that of the hair-seal,‡ which is inaudible. This volubility of the fur-seal is decidedly characteristic and prominent; he utters a hoarse, resonant roar, loud and long; he gives vent to a low, entirely different, gurgling growl; he emits a chuckling, sibilant, piping whistle, of which it is impossible to convey an adequate idea, for it must be heard to be understood; and this spitting or *choo* sound just mentioned. The cows§ have but one note—a hollow, prolonged, bla-a-ting call, addressed only to their pups; on all other occasions they are usually silent. It is something strangely like the cry of a calf or an old sheep. They also make a spitting sound or snort when suddenly disturbed—a kind of a cough, as it were. The pups "blaät" also, with little or no variation, their sound being somewhat weaker and hoarser than their mother's, after birth; they, too, comically spit or cough when aroused suddenly from a nap or driven into a corner, opening their little mouths like young birds in a nest, when at bay, backed up in some crevice, or against some tussock.

Indeed, so similar is the sound, that I noticed that a number of sheep which the Alaska Commercial Company had brought up from San Francisco to St. George island, during the summer of 1873, were constantly attracted to the rookeries, and were running in among the "holluschickie"; so much so, that they neglected the good pasturage

* "Hauling up," a technical term, applied to the action of the seals when they land from the surf and haul up or drag themselves over the beach. It is expressive and appropriate, as are most of the sealing phrases.

† *Eumetopias Stelleri*.

‡ *Phoca vitulina*.

§ Without explanation, I may be considered as making use of paradoxical language by using these terms of description; for the inconsistency of talking of "pups", with "cows", and "bulls", and "rookeries", on the breeding-grounds of the same, cannot fail to be noticed; but this nomenclature has been given and used by the American and English whaling and sealing parties for many years, and the characteristic features of the seals themselves so suit the naming, that I have felt satisfied to retain the style throughout as rendering my description more intelligible, especially so to those who are engaged in the business, or may be hereafter. The Russians are more consistent, but not so "pat"; they call the bull "see-catch", a term implying strength, vigor, etc.; the cow, "matkah," or mother; the pups, "kotickie," or little seals; the non-breeding males under six and seven years, "holluschickie," or bachelors. The name applied collectively to the fur-seal by them is "morskio-kot," or sea-cat.

on the uplands beyond, and a small boy had to be regularly employed to herd them where they could feed to advantage. These transported *Orcas*, though they could not possibly find anything in their eyes suggestive of companionship among the seals, had their ears so charmed by the sheep-like accents of the female pinnipeds, as to persuade them against their senses of vision and smell.

The sound which arises from these great breeding-grounds of the fur-seal, where thousands upon tens of thousands of angry, vigilant bulls are roaring, clucking, and piping, and multitudes of seal-mothers are calling in hollow, blating tones to their young, that in turn respond incessantly, is simply defiance to verbal description. It is, at a slight distance, softened into a deep booming, as of a cataract; and I have heard it, with a light, fair wind to the leeward, as far as six miles out from land on the sea; and even in the thunder of the surf and the roar of heavy gales, it will rise up and over to your ear for quite a considerable distance away. It is the monitor which the sea-captains anxiously strain their ears for, when they run their dead reckoning up, and are laying to for the fog to rise, in order that they may get their bearings of the land; once heard, they hold on to the sound and feel their way in to anchor. The seal-roar at "Novastoshnah" during the summer of 1872, saved the life of the surgeon*, and six natives belonging to the island, who had pushed out on an eggng-trip from Northeast point to Walrus island. I have sometimes thought, as I have listened through the night to this volume of extraordinary sound, which never ceases with the rising or the setting of the sun throughout the entire season of breeding, that it was fully equal to the churning boom of the waves of Niagara. Night and day, throughout the season, this din upon the rookeries is steady and constant.

EFFECTS OF HEAT ON THE SEALS.—The seals seem to suffer great inconvenience and positive misery from a comparatively low degree of heat. I have often been surprised to observe that, when the temperature was 46° and 48° Fahr. on land during the summer, they would show everywhere signs of distress, whenever they made any exertion in moving or fighting, evidenced by panting and the elevation of their hind-flippers, which they used incessantly as so many fans. With the thermometer again higher, as it is at rare intervals, standing at 55° and 60°, they then seem to suffer even when at rest; and at such times the eye is struck by the kaleidoscopic appearance of a rookery—in any of these rookeries where the seals are spread out in every imaginable position their lithesome bodies can assume, all industriously fan themselves; they use sometimes the fore-flippers as ventilators, as it were, by holding them aloft motionless, at the same time fanning briskly with the hinder ones, according as they sit or lie. This wavy motion of fanning or flapping gives a hazy indistinctness to the whole scene, which is difficult to express in language; but one of the most prominent characteristics of the fur-seal, and perhaps the most unique feature, is this very fanning manner in which they use their flippers, when seen on the breeding-grounds at this season. They also, when idle, as it were, off-shore at sea, lie on their sides in the water with only a partial exposure of the body, the head submerged, and then hoist up a fore- or hind-flipper clear out of the water, at the same time scratching themselves or enjoying a momentary nap; but in this position there is no fanning. I say "scratching", because the seal, in common with all animals, is preyed upon by vermin, and it has a peculiar species of louse, or parasitic tick, that belongs to it.

SLEEPING AFLOAT.—Speaking of the seal as it rests in the water, leads me to remark that they seem to sleep as sound and as comfortably, bedded on the waves or rolled by the swell, as they do on the land; they lie on their backs, fold the fore-flippers down across the chest, and turn the hind ones up and over, so that the tips rest on their necks and chins, thus exposing simply the nose and the heels of the hind-flippers above water, nothing else being seen. In this position, unless it is very rough, the seal sleeps as serenely as did the prototype of that memorable song, who was "rocked in the cradle of the deep".

FASTING OF THE SEALS AT THE ROOKERIES: INTESTINAL WORMS.—All the bulls, from the very first, that have been able to hold their positions, have not left them from the moment of their landing for a single instant, night or day; nor will they do so until the end of the rutting season, which subsides entirely between the 1st and 10th of August, beginning shortly after the coming of the cows in June. Of necessity, therefore, this causes them to fast, to abstain entirely from food of any kind, or water, for three months at least; and a few of them actually stay out four months, in total abstinence, before going back into the water for the first time after "hauling up" in May; they then return as so many bony shadows of what they were only a few months anteriorly; covered with wounds, abject and spiritless, they laboriously crawl back to the sea to renew a fresh lease of life.

Such physical endurance is remarkable enough alone; but it is simply wonderful, when we come to associate this fasting with the unceasing activity, restlessness, and duty devolved upon the bulls as the heads of large families. They do not stagnate like hibernating bears in caves; there is not one torpid breath drawn by them in the whole period of their fast; it is evidently sustained and accomplished by the self-absorption of their own fat, with which they are so liberally supplied when they first come out from the sea and take up their positions on the breeding-grounds; and which gradually disappears, until nothing but the staring hide, protruding tendons and bones mark the limit of their abstinence. There must be some remarkable provision made by nature for the

* Dr. Otto Cramer. The suddenness with which fog and wind shut down and sweep over the sea here, even when the day opens most auspiciously for a short boat-voyage, has so alarmed the natives in times past, that a visit is now never made by them from island to island, unless on one of the company's vessels. Several bidarrahs have never been heard from, which, in earlier times, attempted to sail, with picked crews of the natives, from one island to the other.

entire torpidity of the seals' stomachs and bowels, in consequence of their being empty and unsupplied during this long period, coupled with the intense activity and physical energy of the animals throughout that time, which, however, in spite of the violation of a supposed physiological law, does not seem to affect them, for they come back just as sleek, fat, and ambitious as ever, in the following season.

I have examined the stomachs of hundreds which were driven up and killed immediately after their arrival in the spring, near the village; I have the word of the natives here, who have seen hundreds of thousands of them opened during the slaughtering-seasons past, but in no single case has anything ever been found, other than the bile and ordinary secretions of healthy organs of this class, with the marked exception of finding in every one a snarl or cluster of worms,* from the size of a walnut to a bunch as large as a man's fist. Fasting apparently has no effect upon the worms, for on the rare occasion, and perhaps the last one that will ever occur, of killing three or four hundred old bulls late in the fall to supply the natives with canoe skins, I was present, and again examined their paunches, finding the same *ascaridae* within. They were lively in these empty stomachs, and their presence, I think, gives some reason for the habit which the old bulls have (the others do not) of swallowing small water-worn boulders, the stones in some of the stomachs weighing half a pound apiece, in others much smaller. In one paunch I found over five pounds, in the aggregate, of large pebbles, which, in grinding against one another, I believe, must comfort the seal by aiding to destroy, in a great measure, those intestinal pests.

The sea-lion is also troubled in the same way by a similar species of worm, and I preserved the stomach of one of these animals in which there was more than ten pounds of stones, some of them alone very great in size. Of this latter animal, I suppose it could swallow boulders that weigh two and three pounds each. I can ascribe no other cause for this habit among those animals than that given, as they are the highest type of the carnivora, eating fish as a regular means of subsistence, varying the monotony of this diet with occasional juicy fronds of sea-weed or kelp, and perhaps a crab or such once in a while, provided it is small and tender or soft-shelled. I know that the sailors say that the *Callorhinus* swallows these stones to "ballast" himself; in other words, to enable him to dive deeply and quickly; but I noticed that the females and the "holluschiekie" dive quicker and swim better than the old fellows above specified, and they do so without any ballast. They also have less muscular power, only a tithe of that which the "see-catch" possesses. No, the ballast theory is not tenable. (See note, 39, J.)

ARRIVAL OF THE COW-SEALS AT THE ROOKERIES.—Between the 12th and 14th of June, the first of the cow-seals, as a rule, come up from the sea; then the long agony of the waiting bulls is over, and they signalize it by a period of universal, spasmodic, desperate fighting among themselves. Though they have quarreled all the time from the moment they first landed, and continue to do so until the end of the season, in August, yet that fighting which takes place at this date is the bloodiest and most vindictive known to the seal. I presume that the heaviest percentage of mutilation and death among the old males from these brawls, occur in this week of the earliest appearance of the females.

A strong contrast now between the males and females looms up, both in size and shape, which is heightened by the air of exceeding peace and dove-like amiability which the latter class exhibit, in contradistinction to the ferocity and saturnine behavior of the former.

DESCRIPTION OF THE COW-SEAL.—The cows are from 4 to 4½ feet in length from head to tail, and much more shapely in their proportions than the bulls; there is no wrapping around their necks and shoulders of unsightly masses of blubber; their lithe, elastic forms, from the first to the last of the season, are never altered; this they are, however, enabled to keep, because in the provision of seal-economy, they sustain no protracted fasting period; for, soon after the birth of their young they leave it on the ground and go to the sea for food, returning perhaps to-morrow, perhaps later, even not for several days in fact, to again suckle and nourish it; having in the mean time sped far off to distant fishing banks, and satiated a hunger which so active and highly organized an animal must experience, when deprived of sustenance for any length of time.

As the females come up wet and dripping from the water, they are at first a dull, dirty-gray color, dark on the back and upper parts, but in a few hours the transformation in their appearance made by drying is wonderful. You would hardly believe that they could be the same animals, for they now fairly glisten with a rich steel and maltese gray luster on the back of the head, the neck, and along down the spine, which blends into an almost snow-white over the chest and on the abdomen. But this beautiful coloring in turn is again altered by exposure to the same weather; for after a few days it will gradually change, so that by the lapse of two or three weeks it is a dull, rufous-ocher below, and a cinereous brown and gray mixed above. This color they retain throughout the breeding-season, up to the time of shedding their coat in August.

The head and eye of the female are exceedingly beautiful; the expression is really attractive, gentle, and intelligent; the large, lustrous, blue-black eyes are humid and soft with the tenderest expression, while the small, well-formed head is poised as gracefully on her neck as can be well imagined; she is the very picture of benignity and satisfaction, when she is perched up on some convenient rock, and has an opportunity to quietly fan herself, the eyes half-closed and the head thrown back on her gently-swelling shoulders.

The females land on these islands not from the slightest desire to see their uncouth lords and masters, but from

* *Nematoda.*

an accurate and instinctive appreciation of the time in which their period of gestation ends. They are in fact driven up to the rookeries by this cause alone; the young cannot be brought forth in the water, and in all cases marked by myself, the pups were born soon after landing, some in a few hours, but most usually a day or so elapses before delivery.

ORGANIZATION OF THE ROOKERIES.—They are noticed and received by the males on the water-line stations with attention; they are alternately coaxed and urged up on to the rocks, as far as these beach-masters can do so, by chuckling, whistling, and roaring, and then they are immediately under the most jealous supervision; but, owing to the covetous and ambitious nature of the bulls which occupy these stations to the rear of the water-line and way back, the little cows have a rough-and-tumble time of it when they begin to arrive in small numbers at first; for no sooner is the pretty animal fairly established on the station of male number one, who has welcomed her there, then he, perhaps, sees another one of her style in the water from whence she has come, and, in obedience to his polygamous feeling, devotes himself anew to coaxing the later arrival, by that same winning manner so successful in the first case; then when bull number two, just back, observes bull number one off guard, he reaches out with his long strong neck and picks up the unhappy but passive cow by the scruff of her's, just as a cat does a kitten, and deposits her upon his seraglio ground; then bulls number three and four, and so on, in the vicinity, seeing this high-handed operation, all assail one another, especially number two, and for a moment have a tremendous fight, perhaps lasting half a minute or so, and during this commotion the little cow is generally moved, or moves, farther back from the water, two or three stations more, where, when all gets quiet again, she usually remains in peace. Her last lord and master, not having the exposure to such diverting temptation as her first, gives her such care that she not only is unable to leave, did she wish, but no other bull can seize upon her. This is only a faint (and I fully appreciate it), wholly inadequate description of the hurly-burly and the method by which the rookeries are filled up, from first to last, when the females arrive. That is only one instance of the many trials and tribulations which both parties on the rookery subject themselves to, before the harems are filled.

Far back, fifteen or twenty "see-catchie" stations deep from the water-line, and sometimes more, but generally not over an average of ten or fifteen, the cows crowd in at the close of the season for arriving, which is by the 10th or 14th of July; then they are able to go about pretty much as they please, for the bulls have become so greatly enfeebled by this constant fasting, fighting, and excitement during the past two months, that they are quite content now even with only one or two partners, if they should have no more.

The cows seem to haul up in compact bodies from the water, filling in the whole ground to the rear of the rookeries, never scattering about over the surface of this area; they have mapped out from the first their chosen resting places, and they will not lie quietly in any position outside of the great mass of their kind. This is due to their intensely gregarious nature, and admirably adapted for their protection. And here I should call attention to the fact, that they select this rookery-ground with all the skill of civil engineers. It is preferred with special reference to the drainage, for it must lie so that the produce of the constantly dissolving fogs and rain-clouds shall not lie upon them, having a great aversion to, and a firm determination to rest nowhere on water-puddled ground. This is admirably exhibited, and will be understood by a study of my sketch-maps which follow, illustrative of these rookeries and the area and position of the seals upon them. Every one of those breeding-grounds slopes up gently from the sea, and on no one of them is there anything like a muddy flat.

I found it an exceedingly difficult matter to satisfy myself as to a fair general average number of cows to each bull on the rookery; but, after protracted study, I think it will be nearly correct when I assign to each male a general ratio of from fifteen to twenty females at the stations nearest the water; and for those back in order from that line to the rear, from five to twelve; but there are so many exceptional cases, so many instances where forty-five and fifty females are all under the charge of one male; and then, again, where there are two or three females only, that this question was and is not entirely satisfactory in its settlement to my mind.

Near Ketavie point, and just above it to the north, is an odd wash-out of the basalt by the surf, which has chiseled, as it were, from the foundation of the island, a lava table, with a single roadway or land passage to it. Upon the summit of this footstool I counted forty-five cows, all under the charge of one old veteran. He had them penned up on this table-rock by taking his stand at the gate, as it were, through which they passed up and passed down—a Turkish brute typified.

UNATTACHED MALES.—At the rear of all these rookeries there is invariably a large number of able-bodied males which have come late, but wait patiently, yet in vain, for families; most of them having had to fight as desperately for the privilege of being there as any of their more fortunately-located neighbors, who are nearer the water, and in succession from there to where they are themselves; but the cows do not like to be in any outside position. They cannot be coaxed out where they are not in close company with their female mates and masses. They lie most quietly and contentedly in the largest harems, and cover the surface of the ground so thickly that there is hardly moving or turning room until the females cease to come from the sea. The inaction on the part of the males in the rear during the breeding-season only serves to qualify them to move into the places which are necessarily vacated by those males that are, in the mean-time, obliged to leave from virile exhaustion, or incipient wounds. All the surplus able-bodied males, that have not been successful in effecting a landing on the rookeries,

cannot at any one time during the season be seen here on this rear line. Only a portion of their number are in sight; the others are either loafing at sea, adjacent, or are hauled out in morose squads between the rookeries on the beaches.

COURAGE OF THE FUR-SEALS.—The courage with which the fur-seal holds his position as the head and guardian of a family, is of the highest order. I have repeatedly tried to drive them from their harem posts, when they were fairly established on their stations, and have always failed, with few exceptions. I might use every stone at my command, making all the noise I could. Finally, to put their courage to the fullest test, I have walked up to within twenty feet of an old veteran, toward the extreme end of Tolstoi, who had only four cows in charge, and commenced with my double-barreled fowling-piece to pepper him all over with fine mustard-seed shot, being kind enough, in spite of my zeal, not to put out his eyes. His bearing, in spite of the noise, smell of powder, and painful irritation which the fine shot must have produced, did not change in the least from the usual attitude of determined, plucky defense, which nearly all of the bulls assumed when attacked with showers of stones and noise; he would dart out right and left with his long neck and catch the timid cows, that furtively attempted to run after each report of my gun, fling and drag them back to their places under his head; and then, stretching up to his full height look me directly and defiantly in the face, roaring and chuckling most vehemently. The cows, however, soon got away from him; they could not stand my racket in spite of their dread of him; but he still stood his ground, making little charges on me of ten or fifteen feet, in a succession of gallops or lunges, spitting furiously, and then comically retreating to the old position, with an indescribable leer and swagger, back of which he would not go, fully resolved to hold his own or die in the attempt.

This courage is all the more noteworthy from the fact that, in regard to man, it is invariably of a defensive character. The seal is always on the defensive; he never retreats, and he will not attack. If he makes you return when you attack him, he never follows you much farther than the boundary of his station, and then no aggravation will compel him to take the offensive, so far as I have been able to observe. I was very much impressed by this trait.

BEHAVIOR OF THE FEMALE SEALS ON THE ROOKERIES.—The cows, during the whole season, do great credit to their amiable expression, by their manner and behavior on the rookery; they never fight or quarrel one with another, and never or seldom utter a cry of pain or rage when they are roughly handled by the bulls, which frequently get a cow between them and actually tear the skin from her back with their teeth, cutting deep gashes in it as they snatch her from mouth to mouth. If sand does not get into these wounds it is surprising how rapidly they heal; and, from the fact that I never could see scars on them anywhere except the fresh ones of this year, they must heal effectually and exhibit no trace the next season.

The cows, like the bulls, vary much in weight, but the extraordinary disparity in the size of the sexes, adult, is exceedingly striking. Two females taken from the rookery nearest to St. Paul village, right under the bluffs, and almost beneath the eaves of the natives' houses, called "Nah Speel", after they had brought forth their young, were weighed by myself, and their respective returns on the scales were 56 and 100 pounds each; the former being about three or four years old, and the latter over six—perhaps ten; both were fit, or rather in good condition—as good as they ever are. Thus the female is just about one-sixth the size of the male.* Among the sea-lions the proportion is just one-half the bulk of the male,† while the hair-seals, as I have before stated, are not distinguishable in this respect, as far as I could observe, but my notice was limited to a few specimens only.

ATTITUDES OF FUR-SEALS ON LAND.—It is quite beyond my power, indeed entirely out of the question, to give a fair idea of the thousand and one positions in which the seals compose themselves and rest when on land. They may be said to assume every possible attitude which a flexible body can be put into, no matter how characteristic or seemingly forced or constrained. Their joints seem to be double-hinged; in fact, all ball and socket union of the bones. One favorite position, especially with the females, is to perch upon a point or edge-top of some rock, and throw their heads back upon their shoulders, with the nose held directly up and aloft; and then closing their eyes, to take short naps without changing their attitude, now and then softly lifting one or the other of their long, slender hind-flippers, which they slowly wave with that peculiar fanning motion to which I have alluded heretofore. Another attitude, and one of the most common, is to curl themselves up just as a dog does on a hearth-rug, bringing the tail and nose close together. They also stretch out, laying the head close to the body, and sleep an hour or two without rising, holding one of the hind-flippers up all the time, now and then gently moving it, the eyes being tightly closed.

I ought, perhaps, to define the anomalous tail of the fur-seal here. It is just about as important as the caudal appendage to a bear, even less significant; it is the very emphasis of abbreviation. In the old males it is positively only four or five inches in length, while among the females only two and a half to three inches, wholly inconspicuous, and not even recognized by the casual observer.

SLEEPING SEALS.—I come now to speak of another feature which interested me nearly, if not quite, as much as any other characteristic of this creature; and that is their fashion of slumber. The sleep of the fur-seal, seen on land, from the old male down to the youngest, is always accompanied by an involuntary, nervous, muscular twitching

* Adult male and female.

† Adult male and female; *Eumetopias Stelleri*.

and slight shifting of the flippers, together with ever and anon quivering and uneasy rollings of the body, accompanied by a quick folding anew of the fore-flippers; all of which may be signs, as it were, in fact, of their simply having nightmares, or of sporting, in a visionary way, far off in some dream-land sea; but perhaps very much as an old nurse said, in reference to the smiles on a sleeping child's face, they are disturbed by their intestinal parasites. I have studied hundreds of such somnolent examples. Stealing softly up so closely that I could lay my hand upon them from the point where I was sitting, did I wish to, and watching the sleeping seals, I have always found their sleep to be of this nervous description. The respiration is short and rapid, but with no breathing (unless the ear is brought very close) or snoring sound; the quivering, heaving of the flanks only indicates the action of the lungs. I have frequently thought that I had succeeded in finding a snoring seal, especially among the pups; but a close examination always gave some abnormal reason for it; generally a slight distemper, never anything severer, however, than some trifle, by which the nostrils were stopped up to a greater or less degree.

The cows on the rookeries sleep a great deal, but the males have the veriest cat-naps that can be imagined. I never could time the slumber of any old male on the breeding-grounds, which lasted without interruption longer than five minutes, day or night; while away from these places, however, I have known them to lie sleeping in the manner I have described, broken by these fitful, nervous, dreamy starts, yet without opening the eyes, for an hour or so at a time.

With the exception of the pups, the fur-seal seems to have very little rest awake or sleeping; perpetual motion is well nigh incarnate with its being.

FUR-SEAL PUPS.—As I have said before, the females, soon after landing, are delivered of their young. Immediately after the birth of the pup (twins are rare, if ever) the little creature finds its voice, a weak, husky blaät, and begins to paddle about with its eyes wide open from the start, in a confused sort of way for a few minutes, until the mother turns around to notice her offspring and give it attention, and still later to suckle it; and for this purpose she is supplied with four small, brown nipples, almost wholly concealed in the fur, and which are placed about eight inches apart, lengthwise with the body, on the abdomen, between the fore- and hind-flippers, with about four inches of space between them transversely. These nipples are seldom visible, and then faintly seen through the hair and fur. The milk is abundant, rich, and creamy. The pups nurse very heartily, almost gorging themselves, so much so that they often have to yield up the excess of what they have taken down, mewing and puking in the most orthodox manner.

The pup from birth, and for the next three months, is of a jet-black color, hair and flippers, save a tiny white patch just back of each forearm. It weighs first from three to four pounds, and is twelve to fourteen inches long. It does not seem to nurse more than once every two or three days, but in this I am very likely mistaken, for they may have received attention from the mother in the night, or other times in the day when I was unable to keep up my watch over the individuals which I had marked for this supervision.

The apathy with which the young are treated by the old on the breeding-grounds, especially by the mothers, was very strange to me, and I was considerably surprised at it. I have never seen a seal-mother caress or fondle her offspring; and should it stray to a short distance from the harem, I could step to and pick it up, and even kill it before the mother's eye, without causing her the slightest concern, as far as all outward signs and manifestation would indicate. The same indifference is also exhibited by the male to all that may take place of this character outside of the boundary of his seraglio; but the moment the pups are inside the limits of his harem-ground, he is a jealous and a fearless protector, vigilant and determined; but if the little animals are careless enough to pass beyond this boundary, then I can go up to them and carry them off before the eye of the old Turk without receiving from him the slightest attention in their behalf—a curious guardian, forsooth!

It is surprising to me how few of these young pups get crushed to death while the ponderous males are floundering over them, engaged in fighting and quarreling among themselves. I have seen two bulls dash at each other with all the energy of furious rage, meeting right in the midst of a small "pod" of forty or fifty pups, tramp over them with all their crushing weight, and bowling them out right and left in every direction by the impetus of their movements, without injuring a single one, as far as I could see. Still, when we come to consider the fact that, despite the great weight of the old males, their broad, flat flippers and yielding bodies may press down heavily on these little fellows without actually breaking bones or mashing them out of shape, it seems questionable whether more than one per cent. of all the pups born each season on these great rookeries of the Pribylov islands are destroyed in this manner on the breeding-grounds.*

The vitality of the fur-seal is simply astonishing. His physical organization passes beyond the fabled nine lives of the cat. As a slight illustration of its tenure of life, I will mention the fact, that one morning the chief came to me with a pup in his arms, which had just been born, and was still womb-moist, saying that the mother had been killed at Tolstoi by accident, and he supposed that I would like to have a "choochil".† I took it up

* The only damage which these little fellows have up here, is being caught by an October gale down at the surf-margin, when they have not fairly learned to swim; large numbers have been destroyed by sudden "nips" of this character.

† Specimen to stuff.

into my laboratory, and finding that it could walk about and make a great noise, I attempted to feed it, with the idea of having a comfortable subject to my pencil, for life study, of the young in the varied attitudes of sleep and motion. It refused everything that I could summon to its attention as food; and, alternately sleeping and walking, in its clumsy fashion, about the floor, it actually lived nine days—spending the half of every day in floundering over the floor, accompanying all movement with a persistent, hoarse, blaaing cry—and I do not believe it ever had a single drop of its mother's milk.

In the pup, the head is the only disproportionate feature at birth, when it is compared with the adult form; the neck being also relatively shorter and thicker. The eye is large, round and full, but almost a "navy blue" at times, it soon changes into the blue-black of adolescence.

The females appear to go to and come from the water to feed and bathe, quite frequently, after bearing their young, and the immediate subsequent coitus with the male; and usually return to the spot or its immediate neighborhood, where they leave their pups, crying out for them, and recognizing the individual replies, though ten thousand around, all together, should blaat at once. They quickly single out their own and nurse them. It would certainly be a very unfortunate matter if the mothers could not identify their young by sound, since their pups get together like a great swarm of bees, and spread out upon the ground in what the sealers call "pods", or clustered groups, while they are young and not very large; but from the middle or end of September, until they leave the islands for the dangers of the great Pacific, in the winter, along by the first of November, they gather in this manner, sleeping and frolicking by tens of thousands, bunched together at various places all over the islands contiguous to the breeding-grounds, and right on them. A mother comes up from the sea, whither she has been to wash, and perhaps to feed, for the last day or two, feeling her way along to about where she thinks her pup should be—at least where she left it last—but perhaps she misses it, and finds instead a swarm of pups in which it has been incorporated, owing to its great fondness for society. The mother, without first entering into the crowd of thousands, calls out just as a sheep does for a lamb; and, out of all the din she—if not at first, at the end of a few trials—recognizes the voice of her offspring, and then advances, striking out right and left, toward the position from which it replies. But if the pup happens at this time to be asleep, it gives, of course, no response, even though it were close by; in the event of this silence the cow, after calling for a time without being answered, curls herself up and takes a nap, or lazily basks, to be usually more successful, or wholly so, when she calls again.

The pups themselves do not know their own mothers—a fact which I ascertained by careful observation—but they are so constituted that they incessantly cry out at short intervals during the whole time they are awake, and in this way the mother can pick out from the monotonous blaaing of thousands of pups, her own, and she will not permit any other to suckle it; but the "koticie" themselves attempt to nose around every seal-mother that comes in contact with them. (See note, 39, I.)

DISORGANIZATION OF THE ROOKERIES.—Between the end of July and the 5th or 8th of August of every year, the rookeries are completely changed in appearance; the systematic and regular disposition of the families or harems over the whole extent of breeding-ground has disappeared; all that clock-work order which has heretofore existed seems to be broken up. The breeding-season over, those bulls which have held their positions since the first of May leave, most of them thin in flesh and weak, and of their number a very large proportion do not come out again on land during the season; but such as are seen at the end of October and November, are in good flesh. They have a new coat of rich, dark, grey-brown hair and fur, with gray or grayish ocher "wigs" of longer hair over the shoulders, forming a fresh, strong contrast to the dull, rusty, brown and umber dress in which they appeared to us during the summer, and which they had begun to shed about the first of August, in common with the females and the "holluschickie". After these males leave, at the close of their season's work and of the rutting for the year, those of them that happen to return to the land in any event do not come back until the end of September, and do not haul upon the rookery-grounds again. As a rule they prefer to herd together, like the younger males, upon the sand-beaches and rocky points close to the water.

The cows and pups, together with those bulls which we have noticed in waiting in the rear of the rookeries, and which have been in retirement throughout the whole of the breeding-season, now take possession, in a very disorderly manner, of the rookeries. There come, also, a large number of young, three, four, and five-year old males, which have been prevented by the menacing threats of the older, stronger bulls, from landing among the females during the rutting-season.

Before the middle of August three-fourths, at least, of the cows at this date are off in the water, only coming ashore at irregular intervals to nurse and look after their pups a short time. They presented to my eye, from the summits of the bluff's round about, a picture more suggestive than anything I have ever seen presented by animal life, of entire comfort and enjoyment. Here, just out and beyond the breaking of the rollers, they idly lie on the rocks or sand-beaches, ever and anon turning over and over, scratching their backs and sides with their fore- and hind-flippers. The seals on the breeding-ground appear to get very lousy. (See note, 39, K.)

MANGY COWS AND PUPS.—The frequent winds and showers drive and spatter sand into their fur and eyes, often making the latter quite sore. This occurs when they are obliged to leave the rocky rookeries and follow their pups out over the sand-ridges and flats, to which they always have a natural aversion. On the hauling-grounds

they pack the soil under foot so hard and tightly in many places, that it holds water in the surface depressions, just like so many rock-basins. Out of and into these puddles the pups and the females flounder and patter incessantly, until evaporation slowly abates the nuisance. This is for the time only, inasmuch as the next day, perhaps, brings more rain, and the dirty pools are replenished.

The pups sometimes get so thoroughly plastered in these muddy, slimy puddles, that the hair falls off in patches, giving them, at first sight, the appearance of being troubled with scrofula or some other plague: from my investigations, directed to this point, I became satisfied that they were not permanently injured, though evidently very much annoyed. With reference to this suggestion as to sickness or distemper among the seals, I gave the subject direct and continued attention, and in no one of the rookeries could I discover a single seal, no matter how old or young, which appeared to be suffering in the least from any physical disorder, other than that which they themselves had inflicted, one upon the other, by fighting. The third season, passing directly under my observation, failed to reward my search with any manifestation of disease among the seals which congregate in such mighty numbers on the rookeries of St. Paul and St. George. The remarkable freedom from all such complaints enjoyed by these animals is noteworthy, and the most trenchant and penetrating cross-questioning of the natives, also, failed to give me any history or evidence of an epidemic in the past.

HOSPITALS.—The observer will, however, notice every summer, gathered in melancholy squads of a dozen to one hundred or so, scattered along the coast where the healthy seals never go, those sick and disabled bulls which have, in the earlier part of the season, been either internally injured or dreadfully scarred by the teeth of their opponents in fighting. Sand is blown by the winds into the fresh wounds and causes an inflammation and a sloughing, which very often finishes the life of the victim. The sailors term these invalid gatherings "hospitals", a phrase which, like most of their homely expressions, is quite appropriate.

YOUNG SEALS LEARNING TO SWIM.—Early in August, usually by the 8th or 10th, I noticed one of the remarkable movements of the season. I refer to the pup's first essay in swimming. Is it not odd—paradoxical—that the young seal, from the moment of his birth until he is a month or six weeks old, is utterly unable to swim? If he is seized by the nape of the neck and pitched out a rod into the water from shore, his bullet-like head will drop instantly below the surface, and his attenuated posterior extremities flap impotently on it; suffocation is the question of only a few minutes, the stupid little creature not knowing how to raise his immersed head and gain the air again. After they have attained the age I indicate, their instinct drives them down to the margin of the surf, where the alternate ebbing and flowing of its wash covers and uncovers the rocky or sandy beaches. They first smell and then touch the moist pools, and flounder in the upper wash of the surf, which leaves them as suddenly high and dry as it immersed them at first. After this beginning they make slow and clumsy progress in learning the knack of swimming. For a week or two, when overhead in depth, they continue to flounder about in the most awkward manner, thrashing the water as little dogs do, with their fore-feet, making no attempt whatever to use the hinder ones. Look at that pup now, launched out for the first time beyond his depth; see how he struggles—his mouth wide open, and his eyes fairly popping. He turns instantly to the beach, ere he has fairly struck out from the point whence he launched in, and, as the reeding swell which at first carried him off his feet and out, now returning, leaves him high and dry, for a few minutes he seems so weary that he weakly crawls up, out beyond its swift returning wash, and coils himself up immediately to take a recuperative nap. He sleeps a few minutes, perhaps half an hour, then awakes as bright as a dollar, apparently rested, and at his swimming lesson he goes again. By repeated and persistent attempts, the young seal gradually becomes familiar with the water and acquainted with his own power over that element, which is to be his real home and his whole support. Once boldly swimming, the pup fairly revels in his new happiness. He and his brethren have now begun to haul and swarm along the whole length of St. Paul coast, from Northeast point down and around to Zapadne, lining the alternating sand-beaches and rocky shingle with their plump, black forms. How they do delight in it! They play with a zest, and chatter like our own children in the kindergartens—swimming in endless evolutions, twisting, turning, or diving—and when exhausted, drawing their plump, round bodies up again on the beach. Shaking themselves dry as young dogs would do, they now either go to sleep on the spot, or have a lazy terrestrial frolic among themselves.

How an erroneous impression ever got into the mind of any man in this matter of the pup's learning to swim, I confess that I am wholly unable to imagine. I have not seen any "driving" of the young pups into the water by the old ones, in order to teach them this process, as certain authors have positively affirmed.* There is not the slightest supervision by the old mother or father of the pup, from the first moment of his birth, in this respect, until he leaves for the North Pacific, full-fledged with amphibious power. At the close of the breeding season, every year, the pups are restlessly and constantly shifting back and forth over the rookery ground of their birth, in large squads, sometimes numbering thousands upon thousands. In the course of this change of position they all sooner or later come in contact with the sea; they then blunder into the water for the first time, in a most awkward, ungainly manner, and get out as quick as they can; but so far from showing any fear or dislike of this, their most natural element, as soon as they rest from their exertion they are immediately ready for a new trial, and keep at it, provided the sea is not too stormy or rough. During all this period of self-tuition they seem thoroughly to enjoy the exercise, in spite of their repeated and inevitable discomfitures at the beginning.

* Allen. *History of North American Pinnipeds*, p. 387.

PODDING OF THE PUPS.—The “podding” of these young pups in the rear of the great rookeries of St. Paul, is one of the most striking and interesting phases of this remarkable exhibition of highly-organized life. When they first bunch together they are all black, for they have not begun to shed the natal coat: they shine with an unctuous, greasy reflection, and grouped in small armies or great regiments on the sand-dune tracts at Northeast point, they present a most extraordinary and fascinating sight. Although the appearance of the “holluschickie” at English bay fairly overwhelms the observer with the impression of its countless multitudes, yet I am free to declare, that at no one point in this evolution of the seal-life, during the reproductive season, have I been so deeply stricken by the sense of overwhelming enumeration, as I have when, standing on the summit of Cross hill, I looked down to the southward and westward over a reach of six miles of alternate grass and sand-dune stretches, mirrored upon which were hundreds of thousands of these little black pups, spread in sleep and sport within this restricted field of vision. They appeared as countless as the grains of the sand upon which they rested.

SECOND CHANGE OF COAT.—By the 15th of September, all the pups born during the year have become familiar with the water; they have all learned to swim, and are now nearly all down by the water's edge, skirting in large masses the rocks and beaches previously this year unoccupied by seals of any class. Now they are about five or six times their original weight, or, in other words, they are 30 to 40 pounds avoirdupois, as plump and fat as butter-balls, and they begin to take on their second coat, shedding their black pup-hair completely. This second coat does not vary in color, at this age, between the sexes. They effect this transformation in dress very slowly, and cannot, as a rule, be said to have ceased their molting until the middle or 20th of October.

This second coat, or sea-going jacket, of the pup, is a uniform, dense, light-gray over-hair, with an under-fur which is slightly grayish in some, but is, in most cases, a soft, light-brown hue. The over-hair is fine, close, and elastic, from two-thirds of an inch to an inch in length, while the fur is not quite half an inch long. Thus the coarser hair shingles over and conceals the soft under-wool completely, giving the color by which, after the second year, the sex of the animal is recognized. The pronounced difference between the sexes is not effected, however, by color alone until the third year of the animal. This over-hair of the young pup's new jacket on the back, neck, and head, is a dark chinchilla-gray, blending into a stone-white, just tinged with a grayish tint on the abdomen and chest. The upper lip, upon which the whiskers or moustaches take root, is covered with hair of a lighter gray than that of the body. This moustache consists of fifteen or twenty longer or shorter bristles, from half an inch to three inches in length, some brownish, horn-colored, and others whitish-gray and translucent, on each side and back and below the nostrils, leaving the muzzle quite prominent and hairless. The nasal openings and their surroundings are, as I have before said when speaking of this feature, similar to those of a dog.

EYES OF THE PUP-SEALS.—The most attractive feature about the fur-seal pup, and that which holds this place as it grows on and older, is the eye. This organ is exceedingly clear, dark, and liquid, with which, for beauty and amiability, together with real intelligence of expression, those of no other animal that I have ever seen, or have ever read of, can be compared; indeed, there are few eyes in the orbits of men and women which suggest more pleasantly the ancient thought of their being “windows to the soul”. The lids to the eye are fringed with long, perfect lashes, and the slightest irritation in the way of dust or sand, or other foreign substances, seems to cause them exquisite annoyance, accompanied by immoderate weeping. This involuntary tearfulness so moved Steller that he ascribed it to the processes of the seal's mind, and declared that the seal-mothers actually shed tears.

RANGE OF VISION.—I do not think that their range of vision on land, or out of the water, is very great. I have frequently experimented with adult fur-seals, by allowing them to catch sight of my person, so as to distinguish it as of foreign character, three and four hundred paces off, taking the precaution of standing to the leeward of them when the wind was blowing strong, and then walking unconcernedly up to them. I have invariably noticed, that they would allow me to approach quite close before recognizing my strangeness; this occurring to them, they at once made a lively noise, a medley of coughing, spitting, snorting, and baaing, and plunged in spasmodic lopes and shambled to get away from my immediate neighborhood; as to the pups, they all stupidly stare at the form of a human being until it is fairly on them, when they also repeat in miniature these vocal gymnastics and physical efforts of the older ones, to retreat or withdraw a few rods, sometimes only a few feet, from the spot upon which you have cornered them, after which they instantly resume their previous occupation of either sleeping or playing, as though nothing had happened. (See note, 39, M.)

POWER OF SCENT: ODOR OF THE SEALS.—The greatest activity displayed by any one of the five senses of the seal, is evidenced in its power of scent. This faculty is all that can be desired in the line of alertness. I never failed to awaken an adult seal from the soundest sleep, when from a half to a quarter of a mile distant, no matter how softly I proceeded, if I got to the windward, though they sometimes took alarm when I was a mile off.

They leave evidences of their being on these great reproductive fields, chiefly at the rookeries, in the hundreds of dead carcasses which mark the last of those animals that have been rendered infirm, sick, or were killed by fighting among themselves in the early part of the season, or of those which have crawled far away from the scene of battle to die from death-wounds received in the bitter struggle for a harem. On the rookeries, wherever these lifeless bodies rest, the living, old and young, clamber and patter backward and forward over and on the putrid remains, and by this constant stirring up of decayed matter, give rise to an exceedingly disagreeable and far-

reaching "funk". This has been, by all writers who have dwelt on the subject, referred to as the smell which these animals emit for another reason—erroneously called the "rutting odor". If these creatures have any odor peculiar to them when in this condition, I will frankly confess that I am unable to distinguish it from the fumes which are constantly being stirred up and rising out of those decaying carcasses of the older seals, as well as from the bodies of the few pups which have been killed accidentally by the heavy bulls fighting over them, charging back and forth against one another, so much of the time.

They have, however, a very characteristic and peculiar smell, when they are driven and get heated; their breath exhalations possess a disagreeable, faint, sickly odor, and when I have walked within its influence at the rear of a seal-drive, I could almost fancy, as I entered my nostrils, that I stood beneath an ailanthus tree in bloom; but this odor can by no means be confounded with what is universally ascribed to another cause. It is also noteworthy, that if your finger is touched ever so lightly to a little fur-seal blubber, it will smell very much like that which I have appreciated and described as peculiar to their breath, which arises from them when they are driven, only it is a little stronger. Both the young and old fur-seals have this same breath-taint at all seasons of the year.

REVIEW OF STATEMENTS CONCERNING LIFE IN THE ROOKERIES.—To recapitulate and sum up the system and regular method of life and reproduction on these rookeries of St. Paul and St. George, as the seals seem to have arranged it, I shall say that—

First. The earliest bulls land in a negligent, indolent way, at the opening of the season, soon after the rocks at the water's edge are free from ice, frozen snow, etc. This is, as a rule, about the 1st to the 5th of every May. They land from the beginning to the end of the season in perfect confidence and without fear; they are very fat, and will weigh at an average 500 pounds each; some stay at the water's edge, some go to the tier back of them again, and so on until the whole rookery is mapped out by them, weeks in advance of the arrival of the first female.

Second. That by the 10th or 12th of June, all the male stations on the rookeries have been mapped out and fought for, and held in waiting by the "see-catchie". These males are, as a rule, bulls rarely ever under six years of age; most of them are over that age, being sometimes three, and occasionally doubtless four, times as old.

Third. That the cows make their first appearance, as a class, on or after the 12th or 15th of June, in very small numbers; but rapidly after the 23d and 25th of this month, every year, they begin to flock up in such numbers as to fill the harems very perceptibly; and by the 8th or 10th of July, they have all come, as a rule—a few stragglers excepted. The average weight of the females now will not be much more than 80 to 90 pounds each.

Fourth. That the breeding-season is at its height from the 10th to the 15th of July every year, and that it subsides entirely at the end of this month and early in August; also, that its method and system are confined entirely to the land, never effected in the sea.

Fifth. That the females bear their first young when they are three years old, and that the period of gestation is nearly twelve months, lacking a few days only of that lapse of time.

Sixth. That the females bear a single pup each, and that this is born soon after landing; no exception to this rule has ever been witnessed or recorded.

Seventh. That the "see-catchie" which have held the harems from the beginning to the end of the season, leave for the water in a desultory and straggling manner at its close, greatly emaciated, and do not return, if they do at all, until six or seven weeks have elapsed, when the regular systematic distribution of the families over the rookeries is at an end for this season. A general medley of young males now are free, which come out of the water, and wander over all these rookeries, together with many old males, which have not been on scraglio duty, and great numbers of the females. An immense majority over all others present are pups, since only about 25 per cent. of the mother-seals are out of the water now at any one time.

Eighth. That the rookeries lose their compactness and definite boundaries of true breeding-limit and expansion by the 25th to the 28th of July every year; then, after this date, the pups begin to haul back, and to the right and left, in small squads at first, but as the season goes on, by the 18th of August, they depart without reference to their mothers; and when thus scattered, the males, females, and young swarm over more than three and four times the area occupied by them when breeding and born on the rookeries. The system of family arrangement and uniform compactness of the breeding classes breaks up at this date.

Ninth. That by the 8th or 10th of August the pups born nearest the water first begin to learn to swim; and that by the 15th or 20th of September they are all familiar, more or less, with the exercise.

Tenth. That by the middle of September the rookeries are entirely broken up; confused, straggling bands of females are seen among bachelors, pups, and small squads of old males, crossing and recrossing the ground in an aimless, listless manner. The season now is over.

Eleventh. That many of the seals do not leave these grounds of St. Paul and St. George before the end of December, and some remain even as late as the 12th of January; but that by the end of October and the beginning of November every year, all the fur-seals of mature age—five and six years, and upward—have left the islands. The younger males go with the others: many of the pups still range about the islands, but are not hauled to any great extent on the beaches or the flats. They seem to prefer the rocky shore-margin, and to lie as high up as they can get on such bluff rookeries as Tolstoi and the Reef. By the end of this month, November, they are, as a rule, all gone.

Such is the sum and the substance of my observations which relate to the breeding-grounds alone on St. Paul and St. George. It is the result of summering and wintering on them, and these definite statements I make with that confidence which one always feels, when he speaks of that which has entered into his mind by repeated observation, and has been firmly grounded by careful deductions therefrom.

10. THE "HOLLUSCHICKIE" OR "BACHELOR" SEALS—A DESCRIPTION.

THE HAULING-GROUNDS AND THEIR OCCUPANTS.—I now call the attention of the reader to another very remarkable feature in the economy of the seal-life on these islands. The great herds of "holluschickie",* numbering from one-third to one half, perhaps, of the whole aggregate of near 5,000,000 seals known to the Pribylov group, are never allowed by the "see-catchie", under the pain of frightful mutilation or death, to put their flippers on or near the rookeries.

By reference to my map, it will be observed that I have located a large extent of ground—markedly so on St. Paul—as that occupied by the seals' "hauling-grounds"; this area, in fact, represents those portions of the island upon which the "holluschickie" roam in their heavy squadrons, wearing off and polishing the surface of the soil, stripping every foot, which is indicated on the chart as such, of its vegetation and mosses, leaving the margin as sharply defined on the bluffy uplands and sandy flats as it is on the map itself.

The reason that so much more land is covered by the "holluschickie" than by the breeding-seals—ten times as much at least—is due to the fact, that though not as numerous, perhaps, as the breeding-seals, they are tied down to nothing, so to speak—are wholly irresponsible, and roam hither and thither as caprice and the weather may dictate. Thus they wear off and rub down a much larger area than the rookery-seals occupy; wandering aimlessly, and going back, in some instances, notably at English bay, from one-half to a whole mile inland, not traveling in desultory files along winding, straggling paths, but sweeping in solid platoons, they obliterate every spear of grass and rub down nearly every hummock in their way.

DEFINITION OF "HOLLUSCHICKIE".—All the male seals, from six years of age, are compelled to herd apart by themselves and away from the breeding-grounds, in many cases far away; the large hauling-grounds at Southwest point being about two miles from the nearest rookery. This class of seals is termed "holluschickie" or the "bachelor" seals by the people, a most fitting and expressive appellation.

The seals of this great subdivision are those with which the natives on the Pribylov group are the most familiar: naturally and especially so, since they are the only ones, with the exception of a few thousand pups, and occasionally an old bull or two, taken late in the fall for food and skins, which are driven up to the killing-grounds at the village for slaughter. The reasons for this exclusive attention to the "bachelors" are most cogent, and will be given hereafter when the "business" is discussed.

LOCATING THE HAULING-GROUNDS: PATHS THROUGH THE ROOKERIES.—Since the "holluschickie" are not permitted by their own kind to land on the rookeries and stop there, they have the choice of two methods of locating, one of which allows them to rest in the rear of the rookeries, and the other on the free beaches. The most notable illustration of the former can be witnessed on Reef point, where a pathway is left for their ingress and egress through a rookery—a path left by common consent, as it were, between the harems. On these trails of passage they come and go in steady files all day and all night during the season, unmolested by the jealous bulls which guard the seraglios on either side as they travel; all peace and comfort to the young seal if he minds his business and keeps straight on up or down, without stopping to nose about right or left; all woe and desolation to him, however, if he does not, for in that event he will be literally torn in bloody gripping, from limb to limb, by the vigilant old "see-catchie".

Since the two and three-year old "holluschickie" come up in small squads with the first bulls in the spring, or a few days later, such common highways as those between the rookery-ground and the sea are traveled over before the arrival of the cows, and get well defined. A passage for the "bachelors", which I took much pleasure in observing day after day at Polavina, another at Tolstoi, and two on the Reef, in 1872, were entirely closed up by the "see-catchie" and obliterated, when I again searched for them in 1874. Similar passages existed, however, on several of the large rookeries of St. Paul; one of those at Tolstoi exhibits this feature very finely, for here the hauling-ground extends around from English bay, and lies up back of the Tolstoi rookery, over a flat and rolling summit, from 100 to 120 feet above the sea-level. The young males and yearlings of both sexes come through and between the harems, at the height of the breeding-season, on two of these narrow pathways, and before reaching the ground above, are obliged to climb up an almost abrupt bluff, which they do by following and struggling in the water-runs and washes that are worn into its face. As this is a large hauling-ground, on which, every favorable day during the season, fifteen or twenty thousand commonly rest, the sight of skillful seal-climbing can be witnessed here at any time during that period; and the sight of such climbing as this of Tolstoi is exceedingly novel and interesting. Why, verily, they ascend over and upon places where an ordinary man might, at first sight, with great positiveness say that it was utterly impossible for him to climb.

* The Russian term "holluschickie" or "bachelors" is very appropriate, and is usually employed.

HAULING-GROUNDS ON THE BEACHES.—The other method of coming ashore, however, is the one most followed and favored. In this case they avoid the rookeries altogether, and repair to the unoccupied beaches between them, and then extend themselves out all the way back from the sea, as far from the water, in some cases, as a quarter and even half of a mile. I stood on the Tolstoi sand-dunes one afternoon, toward the middle of July, and had under my eyes, in a straightforward sweep from my feet to Zapadnié, a million and a half of seals spread out on those hauling-grounds. Of these, I estimated that fully one-half, at that time, were pups, yearlings, and "holluschickie". The rookeries across the bay, though plainly in sight, were so crowded, that they looked exactly as I have seen surfaces appear upon which bees had swarmed in obedience to that din and racket made by the watchful apiarian, when he desires to hive the restless honey-makers.

The great majority of yearlings and "holluschickie" are annually hauled out and packed thickly over the sand-beach and upland hauling-grounds, which lay between the rookeries on St. Paul island. At St. George there is nothing of this extensive display to be seen, for here is only a tithe of the seal-life occupying St. Paul, and no opportunity whatever is afforded for an amphibious parade.

GENTLENESS OF THE SEALS.—Descend with me from this sand-dune elevation of Tolstoi, and walk into that drove of "holluschickie" below us; we can do it; you do not notice much confusion or dismay as we go in among them; they simply open out before us and close in behind our tracks, stirring, crowding to the right and left as we go, twelve or twenty feet away from us on each side. Look at this small flock of yearlings, some one, others two, and even three years old, which are coughing and spitting around us now, staring up at our faces in amazement as we walk ahead; they struggle a few rods out of our reach, and then come together again behind us, showing no further sign of notice of ourselves. You could not walk into a drove of hogs, at Chicago, without exciting as much confusion and arousing an infinitely more disagreeable tumult; and as for sheep on the plains, they would stampede far quicker. Wild animals indeed! You can now readily understand how easy it is for two or three men, early in the morning, to come where we are, turn aside from this vast herd in front of and around us two or three thousand of the best examples, and drive them back up, and over to the village. That is the way they get the seals; there is not any "hunting" or "chasing" or "capturing" of fur-seals on these islands.

"HOLLUSCHICKIE" DO NOT FAST.—While the young male seals undoubtedly have the power of going for lengthy intervals without food, they, like the female seals on the breeding-grounds, certainly do not maintain any long fasting periods on land; their coming and going from the shore is frequent and irregular, largely influenced by the exact condition of the weather from day to day; for instance, three or four thick, foggy days seem to call them out from the water by hundreds of thousands upon the different hauling-grounds (which the reader observes recorded on my map). In some cases, I have seen them lie there so close together that scarcely a foot of ground, over whole acres, is bare enough to be seen; then a clear and warmer day follows, and this seal-covered ground, before so thickly packed with animal life, will soon be almost deserted: comparatively so at least, to be filled up immediately as before, when favorable weather shall again recur. They must frequently eat when here, because the first yearlings and "holluschickie" that appear in the spring are no fatter, sleeker, or livelier than they are at the close of the season; in other words, their condition, physically, seems to be the same from the beginning to the end of their appearance here during the summer and fall. It is quite different, however, with the "see-catch"; we know how and where it spends two to three months, because we find it on the grounds at all times, day or night, during that period.

SPORTS AND PASTIMES OF THE YOUNG "BACHELORS."—A small flock of the young seals, one to three years old, generally, will often stray from these hauling-ground margins, up and beyond, over the fresh mosses and grasses, and there sport and play one with another, just as little puppy-dogs do; and when weary of this gamboling a general disposition to sleep is suddenly manifested, and they stretch themselves out and curl up in all the positions and all the postures that their flexible spines and ball-and-socket joints will permit. They seem to revel in the unwonted vegetation, and to be delighted with their own efforts in rolling down and crushing the tall stalks of the grasses and umbelliferous plants; one will lie upon its back, hold up its hind-flippers, and lazily wave them about, while it scratches, or rather rubs, its ribs with the fore-hands alternately, the eyes being tightly closed during the whole performance; the sensation is evidently so luxurious that it does not wish to have any side-issue draw off its blissful self-attention. Another, curled up like a cat on a rug, draws its breath, as indicated by the heaving of its flanks, quickly but regularly, as though in heavy sleep; another will lie flat upon its stomach, its hind-flippers covered and concealed, while it tightly folds its fore-feet back against its sides, just as a fish carries its pectoral fins—and so on to no end of variety, according to the ground and the fancy of the animals.

These "bachelor" seals are, I am sure, without exception, the most restless animals in the whole brute creation, which can boast of a high organization. They frolic and lope about over the grounds for hours, without a moment's cessation, and their sleep, after this, is exceedingly short, and it is ever accompanied with nervous twitchings and uneasy muscular movements; they seem to be fairly brimful and overrunning with spontaneity—to be surcharged with fervid, electric life.

Another marked feature which I have observed among the multitudes of "holluschickie", which have come under my personal observation and auditory, and one very characteristic of this class, is, that nothing like ill-humor



Fluett
del. et. sculp.

Zapadale.

S. W. Point.

Upper Zapadale.

Cone Hill.

NATIVES SELECTING A DRIVE.

View over hauling-grounds of "holluschickie" at English Bay, looking west from Tolstoi Sand-dunes.

appears in all of their playing together; they never growl or bite, or show even the slightest angry feeling, but are invariably as happy, one with another, as can be imagined. This is a very singular trait; they lose it, however, with astonishing rapidity, when their ambition and strength develops and carries them, in due course of time, to the rookery. (See note, 39, N.)

The pups and yearlings have an especial fondness for sporting on the rocks which are just at the water's level and awash, so as to be covered and uncovered as the surf rolls in. On the bare summit of these wave-worn spots, they will struggle and clamber in groups of a dozen or two at a time throughout the whole day, in endeavoring to push off that one of their number which has just been fortunate enough to secure a landing; the successor has, however, but a brief moment of exultation in victory, for the next roller that comes booming in, together with the pressure by its friends, turns the table, and the game is repeated, with another seal on top. Sometimes, as well as I could see, the same squad of "holluschickie" played for a whole day and night, without a moment's cessation, around such a rock as this, off "Nah Speel" rookery; but in this observation I may be mistaken, because the seals cannot be told apart.

SEALS AMONG THE BREAKERS.—The graceful unconcern with which the fur-seal sports safely in, among, and under booming breakers, during the prevalence of the numerous heavy gales at the islands, has afforded me many consecutive hours of spell-bound attention to them, absorbed in watching their adroit evolutions within the foaming surf, that seemingly, every moment, would, in its fierce convulsions, dash these hardy swimmers, stunned and lifeless, against the iron-bound foundations of the shore, which alone checked the furious rush of the waves. Not at all. Through the wildest and most ungovernable mood of the roaring tempest and storm-tossed waters attending its transit, I never failed, on creeping out, and peering over the bluffs, in such weather, to see squads of these perfect watermen—the most expert of all amphibians—gamboling in the seething, creamy wake of mighty rollers, which constantly broke in thunder tones over their alert, dodging heads. The swift succeeding seas seemed, every instant, to poise the seals at the very verge of death. Yet the *Callorhinus*, exulting in his skill and strength, bade defiance to their wrath, and continued his diversions.

SWIMMING FEATS OF THE "BACHELORS".—The "holluschickie" are the champion swimmers of all the seal-tribe; at least, when in the water around the islands, they do nearly every fancy tumble and turn that can be executed. The grave old males and their matronly companions seldom indulge in any extravagant display, as do these youngsters, jumping out of the water like so many dolphins, describing beautiful elliptic curves sheer above its surface, rising three and even four feet from the sea, with the back slightly arched, the fore-flippers folded tightly against the sides, and the hinder ones extended and pressed together straight out behind, plunging in head first, to reappear in the same manner, after an interval of a few seconds of submarine swimming, like the flight of a bird, on their course. Sea-lions and hair-seals never jump in this manner. (See note, 39, O.)

All classes will invariably make these dolphin-jumps, when they are surprised or are driven into the water, curiously turning their heads while sailing in the air, between the "rises" and "plumps", to take a look at the cause of their disturbance. They all swim rapidly, with the exception of the pups, and may be said to dart under the water with the velocity of a bird on the wing; as they swim they are invariably submerged, running along horizontally about two or three feet below the surface, guiding their course with the hind-flippers as by an oar, and propelling themselves solely by the fore-feet, rising to breathe at intervals which are either very frequent or else so wide apart that it is impossible to see the speeding animal when he rises a second time.

How long they can remain under water without taking a fresh breath, is a problem which I had not the heart to solve, by instituting a series of experiments at the island; but I am inclined to think that, if the truth were known in regard to their ability of going without rising to breathe, it would be considered astounding. On this point, however, I have no data worth discussing, but will say that, in all their swimming which I have had a chance to study, as they passed under the water, mirrored to my eyes from the bluff above by the whitish-colored rocks below the rookery waters at Great Eastern rookery, I have not been able to satisfy myself how they used their long, flexible hind-feet, other than as steering media. If these posterior members have any perceptible motion, it is so rapid that my eye is not quick enough to catch it; but the fore-flippers, however, can be most distinctly seen, as they work in feathering forward and sweeping flatly back, opposed to the water, with great rapidity and energy. They are evidently the sole propulsive power of the fur-seal in the water, as they are its main fulcrum and lever combined, for progression on land. I regret that the shy nature of the hair-seal never allowed me to study its swimming motions, but it seems to be a general point of agreement among authorities on the *Phocidae*, that all motion in water by them arises from that power which they exert and apply with the hind-feet. So far as my observations on the hair-seal go, I am inclined to agree with this opinion.

All their movements in water, whether they are traveling to some objective point or are in sport, are quick and joyous; and nothing is more suggestive of intense satisfaction and pure physical comfort, than is that spectacle which we can see every August, a short distance out at sea from any rookery where thousands of old males and females are idly rolling over in the billows side by side, rubbing and scratching with their fore- and hind-flippers, which are here and there stuck up out of the water by their owners, like the lateen-sails of the Mediterranean feluccas, or, when the hind-flippers are presented, like a "cat-o-nine tails". They sleep in the water a great deal, too, more than is generally supposed, showing that they do not come on land to rest—very clearly not.

CLASSING THE "HOLLUSCHICKIE" BY AGE.—When the "holluschickie" are up on land they can be readily separated into their several classes as to age, by the color of their coats and size, when noted, namely, the yearlings, the two, three, four, and five years old males. When the yearlings, or the first class, haul out, they are dressed just as they were after they shed their pup-coats and took on the second covering, during the previous year in September and October; and now, as they come out in the spring and summer, one year old, the males and females cannot be distinguished apart, either by color or size, shape or action; the yearlings of both sexes have the same steel-gray backs and white stomachs, and are alike in behavior and weight.

Next year these yearling females, which are now trooping out with the youthful males on the hauling-grounds, will repair to the rookeries, while their male companions will be obliged to come again to this same spot.

SHEDDING THE HAIR: STAGEY SEALS.—About the 15th and 20th of every August, they have become perceptibly "stagey", or, in other words, their hair is well under way in shedding. All classes, with the exception of the pups, go through this process at this time every year. The process requires about six weeks between the first dropping or falling out of the old over-hair, and its full substitution by the new. This takes place, as a rule, between August 1 and September 28.

The fur is shed, but it is so shed that the ability of the seal to take to the water and stay there, and not be physically chilled or disturbed during the process of molting, is never impaired. The whole surface of these extensive breeding-grounds, traversed over by us after the seals had gone, was literally matted with the shed hair and fur. This under-fur or pelage is, however, so fine and delicate, and so much concealed and shaded by the coarser over-hair, that a careless eye or a superficial observer might be pardoned in failing to notice the fact of its dropping and renewal.

The yearling cows retain the colors of the old coat in the new, when they shed it for the first time, and from that time on, year after year, as they live and grow old. The young three-year-olds and the older cows look exactly alike, as far as color goes, when they haul up at first and dry out on the rookeries, every June and July.

The yearling males, however, make a radical change when they shed for the first time, for they come out from their "staginess" in a nearly uniform dark gray, and gray and black mixed, and lighter, with dark ocher to whitish on the upper and under parts, respectively. This coat, next year, when they appear as two-year-olds, shedding for the three-year-old coat, is a very much darker gray, and so on to the third, fourth, and fifth season; then after this, with age, they begin to grow more gray and brown, with rufous-ocher and whitish-tipped over-hair on the shoulders. Some of the very old bulls change in their declining years to a uniform shade all over of dull-grayish ocher. The full glory and beauty of the seal's moustache is denied to him until he has attained his seventh or eighth year.

COMPARATIVE SIZE OF FEMALES AND MALES.—The female does not get her full growth and weight until the end of her fourth year, so far as I have observed, but she does most of her growing longitudinally in the first two; after she has passed her fourth and fifth years, she weighs from 30 to 50 pounds more than she did in the days of her youthful maternity.

The male does not get his full growth and weight until the close of his seventh year, but realizes most of it, osteologically speaking, by the end of the fifth; and from this it may be perhaps truly inferred, that the male seals live to an average age of eighteen or twenty years, if undisturbed in a normal condition, and that the females attain ten or twelve seasons under the same favorable circumstances. Their respective weights, when fully mature and fat in the spring, will, in regard to the male, strike an average of from four to five hundred pounds, while the females will show a mean of from 70 to 80 pounds.

I did not permit myself to fall into error in estimating this matter of weight, because I early found that the apparent huge bulk of a sea-lion bull or fur-seal male, when placed upon the scales, shrank far below my notions: I took a great deal of pains, on several occasions, during the killing-season, to have a platform scale carted out into the field, and as the seals were knocked down, and before they were bled, I had them carefully weighed, constructing the following table from my observations:

TABLE SHOWING THE WEIGHT, SIZE, AND GROWTH OF THE FUR-SEAL (*CALLORHINUS URSINUS*), FROM THE PUP TO THE ADULT, MALE AND FEMALE.

Age.	Length.	Girth.	Gross weight of body.	Weight of skin.	Remarks.
	<i>Inches.</i>	<i>Inches.</i>	<i>Pounds.</i>	<i>Pounds.</i>	
One week.....	12 to 14	10 to 10½	6 to 7½	1½	A male and female, being the only ones of the class handled, June 20, 1873.
Six months.....	24	25	39	3	A mean of ten examples, males and females, alike in size, November 28, 1872.
One year.....	38	25	39	4½	A mean of six examples, males and females, alike in size, July 14, 1873.
Two years.....	45	30	58	5½	A mean of thirty examples, all males, July 24, 1873.
Three years.....	52	36	87	7	A mean of thirty-two examples, all males, July 24, 1873.
Four years.....	58	42	135	12	A mean of ten examples, all males, July 24, 1873.
Five years.....	65	52	200	16	A mean of five examples, all males, July 24, 1873.
Six years.....	72	64	280	25	A mean of three examples, all males, July 24, 1873.
Eight to twenty years.....	75 to 80	70 to 75	400 to 500	45 to 50	An estimate only, calculating on their weight when fat, and early in the season.



St. Paul Island, June and July, 1872.

WEIGHT OF FEMALE SEALS.—The adult females will correspond with the three years old males in the above table, the younger cows weighing frequently only 75 pounds, and many of the older ones going as high as 120, but an average of 80 to 85 pounds is the rule. Those specimens of the females which I weighed were examples taken by me for transmission to the Smithsonian Institution, otherwise I should not have been permitted to make this record of their weight, inasmuch as weighing them means to kill them; and the law and the habit, or rather the prejudice of the entire community up there, is unanimously in opposition to any such proceeding, for they never touch females here, and never set their foot on or near the breeding-grounds on such an errand. It will be noticed, also, that I have no statement of the weights of these exceedingly fat and heavy males which first appear on the breeding-grounds in the spring; those which I have referred to, in the table above given, were very much heavier at the time of their first appearance in May and June, than at the moment when they were in my hands, in July; but the cows, and the other classes, do not sustain protracted fasting, and therefore their weights may be considered substantially the same throughout the year.

CHANGE IN WEIGHT.—Thus, from the fact that all the young seals and females do not change much in weight from the time of their first coming out in the spring, till that of their leaving in the fall and early winter, I feel safe in saying that they feed at irregular but not long intervals, during the time that they are here under our observation, since they are constantly changing from land to water and from water to land, day in and day out. I do not think that the young males fast longer than a week or ten days at a time, as a rule.

DISPERSAL OF THE "HOLLUSCHICKIE".—By the end of October and the 10th of November, the great mass of the "holluschickie", the trooping myriads of English bay, Southwest point, Reef parade, Lukannon sands, the table lands of Polavina, and the mighty hosts of Novostoshnah, at St. Paul, together with the quota of St. George, had taken their departure from its shores, and had gone out to sea, spreading with the receding schools of fish that were now returning to the deep waters of the North Pacific, where, in that vast expanse, over which rolls an unbroken billow, 5,000 miles from Japan to Oregon, they spend the winter and the early spring, until they reappear and break up, with their exuberant life, the dreary winter-isolation of the land which gave them birth.

TASTE OF THE SEALS IN THE MATTER OF WEATHER.—A few stragglers remain, however, as late as the snow and ice will permit them to, in and after December; they are all down by the water's edge then, and haul up entirely on the rocky beaches, deserting the sand altogether; but the first snow that falls makes them very uneasy, and I have seen a large hauling-ground so disturbed by a rainy day and night, that its hundreds of thousands of occupants fairly deserted it. The fur-seal cannot bear, and will not endure, the spattering of sand into its eyes, which always accompanies the driving of a rain-storm; they take to the water, to reappear when the nuisance shall be abated.

The weather in which the fur-seal delights is cool, moist, foggy, and thick enough to keep the sun always obscured, so as to cast no shadows. Such weather, which is the normal weather of St. Paul and St. George, continued for a few weeks in June and July, brings up from the sea millions of fur-seals. But, as I have before said, a little sunshine, which raises the temperature as high as 50° to 55° Fahr., will send them back from the hauling-grounds almost as quickly as they came. Fortunately, these warm, sunny days on the Pribylov islands are so rare that the seals certainly can have no ground of complaint, even if we may presume they have any at all. Some curious facts in regard to their selection of certain localities on these islands, and their abandonment of others, I will discuss in a succeeding chapter, descriptive of the rookeries; this chapter is illustrated by topographical surveys made by myself.

ALBINS.—I looked everywhere and constantly, when treading my way over acres of ground which were fairly covered with seal-pups, and older ones, for specimens that presented some abnormality, that is, monstrosities, albinos, etc., such as I have seen in our great herds of stock; but I was, with one or two exceptions, unable to note anything of the kind. I have never seen any malformations or "monsters" among the pups and other classes of the fur-seals, nor have the natives recorded anything of the kind, so far as I could ascertain from them. I saw only three albino pups among the multitudes on St. Paul, and none on St. George. They did not differ, in any respect, from the normal pups in size and shape. Their hair, for the first coat, was a dull ochre all over; the fur whitish, changing to a rich brown, the normal hue; the flippers and muzzle were a pinkish flesh-tone in color, and the iris of the eye sky-blue. When they shed the following year, they are said to have a dirty, yellowish-white color, which makes them exceedingly conspicuous when mixed in among a vast majority of black pups, gray yearlings, and "holluschickie" of their kind. (See note, 39, O.)

WHERE DO THE SEALS DIE?—It is perfectly evident that a large percentage of this immense number of seals must die every year from natural limitation of life. They do not die on these islands; that much I am certain of. Not one dying a natural death could I find or hear of on the grounds; they evidently lose their lives at sea, preferring to sink with the *rigor mortis* into the cold, blue depths of the great Pacific, or beneath the green waves of Bering sea, rather than to encumber and disfigure their summer haunts on the Pribylov islands.

11. DESCRIPTION OF THE FUR-SEAL ROOKERIES OF ST. PAUL AND ST. GEORGE.

DEARTH OF INFORMATION CONCERNING THE FACTS ABOUT THE ROOKERIES.—Before I can intelligently and clearly present an accurate estimate of the aggregate number of fur-seals which appear upon those great breeding-grounds of the Pribylov group every season, I must take up, in regular sequence, my surveys of these remarkable rookeries which I have illustrated in this memoir by the accompanying sketch-maps, showing topographically the superficial area and distribution assumed by the seal-life at each locality.

It will be observed, that the sum total on St. Paul island preponderates, and completely overshadows that which is represented at St. George. Before passing to the detailed discussion of each rookery, it is well to call attention to a few salient features in regard to the present appearance of the seals on these breeding-grounds, which latter are of their own selection. Touching the location of the fur-seals to-day, as I have recorded and surveyed it, compared with their distribution in early times, I am sorry to say that there is not a single line on a chart, or a word printed in a book, or a note made in manuscript, which refers to this all-important subject, prior to my own work, which I present herewith for the first time to the public. The absence of definite information in regard to what I conceive to be of vital interest and importance to the whole business, astonished me; I could not at first believe it; and, for the last four or five years, I have been searching among the archives of the old Russian company, as I searched diligently when up there, and elsewhere in the territory of Alaska, for some evidence in contradiction of this statement which I have just made. I wanted to find—I hoped to discover—some old record, some clue, by which I could measure with authority and entire satisfaction to my own mind, the relative volume of seal-life in the past, as compared with that which I record in the present, but was disappointed.

I am unable, throughout the whole of the following discussion, to cite a single reliable statement which can give any idea as to the condition and numbers of the fur-seal on these islands, when they were discovered in 1786-'87, or during the whole time of their occupation since, up to the date of my arrival. I mark this so conspicuously, for it is certainly a very strange oversight, a kind of neglect, which, in my opinion, has been, to say the least, inexcusable.

RUSSIAN RECORDS.—In attempting to form an approximate conception of what the seals were or might have been in those early days, as they spread themselves over the hauling- and breeding-grounds of these remarkable islands, I have been thrown entirely upon the vague statements given to me by the natives and one or two of the first American pioneers in Alaska. The only Russian record which touches ever so lightly upon the subject* contains the remarkable statement, which is, in the light of my surveys, simply ridiculous now, that is, that the number of fur-seals on St. George during the first years of Russian occupation, was nearly as great as that on St. Paul. The most superficial examination of the geological character portrayed on the accompanying maps of these two islands, will satisfy any unprejudiced mind as to the total error of such a statement. Why, a mere tithe only of the multitudes which repair to St. Paul, in perfect comfort, over the sixteen to twenty miles of splendid landing-ground found thereon, could visit St. George, when all of the coast-line fit for their reception at this island, is a scant two and a half miles; but for that matter there was, at the time of my arrival and in the beginning of my investigation, a score of equally wild and incredible legends afloat in regard to the rookeries on St. Paul and St. George. Finding, therefore, that the whole work must be undertaken *de novo*, I set about it without further delay.

IMMENSE MORTALITY OF THE SEALS IN 1836.—Prior to the year 1835, no native on the islands seemed to have any direct knowledge or was acquainted with a legendary tradition even, in relation to the seals, concerning their area and distribution on the land here; but they all chimed in after that date with great unanimity, saying that the winter preceding this season (1835-'36) was one of frightful severity; that many of their ancestors who had lived on these islands in large barraboras just back of the Black bluff, near the present village, and at Polavina, then perished miserably.

They say that the cold continued far into the summer; that immense masses of clearer and stronger ice-floes than had ever been known to the waters about the islands, or were ever seen since, were brought down and

* Veniaminov: Zapieskie of Oonalashkenskaho Otdayla, 2 vols., St. Petersburg, 1842. This work of Bishop Innocent Veniaminov is the only one which the Russians can lay claim to as exhibiting anything like a history of western Alaska, or of giving a sketch of its inhabitants and resources, that has the least merit of truth, or the faintest stamp of reliability. Without it we should be simply in the dark as to much of what the Russians were about during the whole period of their occupation and possession of that country. He served, chiefly as a priest and missionary, for 25 years, from 1814 to 1839, at Oonalashka, having the seal-islands in his parish, and was made bishop of all Alaska. He was soon after recalled to Russia, where he has since become the primate of the national church, ranking second to no man in the empire, save the czar; he is advanced in years, being now more than 90 years of age. He must have been a man of fine personal appearance, judging from the following description of him, noted by Sir George Simpson, who met him at Sitka, in 1842, just as he was about to embark for Russia: "His appearance, to which I have already alluded, impresses a stranger with something of awe, while in further intercourse, the gentleness which characterizes his every word and deed, insensibly molds reverence into love; and, at the same time, his talents and attainments are such as to be worthy of his exalted station. With all this, the bishop is sufficiently a man of the world to disdain anything like cant. His conversation, on the contrary, teems with amusement and instruction, and his company is much prized by all who have the honor of his acquaintance." Such is the portrait drawn of him by a governor of the Hudson's Bay Company.

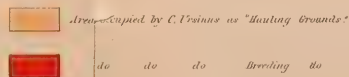


PROFILE of the SOUTH SHORE.

Superficial Area of St. Paul 33 sq. m.: 42 m. shore line (16% of which Seal ground.)

Reef Point	57° 08' 00" N. Lat.	170° 12' 00" W. Long
S. W. "	57° 11' 12" N. Lat.	170° 19' 03" W. Long
N. E. "	57° 16' 04" N. Lat.	170° 00' 02" W. Long
Otter I.	57° 03' 00" N. Lat.	170° 16' 00" W. Long
Walrus I.	57° 11' 05" N. Lat.	169° 49' 05" W. Long

Soundings by Capt. J. C. Baker, U.S. Rev. Marine in fathoms.



shoved high up on to all the rookery-margins, forming an icy wall completely around the island, looming up 20 to 30 feet above the surf; they further state that this wall did not melt or in any way disappear until the middle or end of August, 1836.

They affirm that for this reason the fur-seals, when they attempted to land, according to their habit and their necessity, during June and July, were unable to do so in any considerable numbers. The females were compelled to bring forth their young in the water and at the wet, storm-beaten surf-margins, which caused multitudes of the mothers and all of the young to perish. In short, the result was a virtual annihilation of the breeding-seals. Hence, at the following season, only a spectral, a shadowy imitation of past times could be observed upon the seal-grounds of St. Paul and St. George.

On the Lagoon rookery, now opposite the village of St. Paul, there were then only two males, with a number of cows. At Nah Speel, close by and right under the village, there were then only some 2,000; this the natives know because they counted them. On Zapadnië there were about 1,000 cows, bulls, and pups; at Southwest point there were none. Two small rookeries were then on the north shore of St. Paul, near a place called "Maroonitch"; and there were seven small rookeries running round Northeast point, but on all of these there were only 1,500 males, females, and young; and this number includes the "holluschickie", which, in those days, lay in among the breeding-seals, there being so few old males that they were gladly permitted to do so. On Polavina there were then about 500 cows, bulls, pups, and "holluschickie"; on Lukannon and Keetavie about 300; but on Keetavie there were only ten bulls and so few young males lying in altogether, that these old natives, as they told me, took no note of them on the rookeries just cited. On the Reef, in Gorbotch, were about 1,000 only; in this number last mentioned some 800 "holluschickie" may be included, which lay in with the breeding-seals. There were only twenty old bulls on Gorbotch, and about ten old males on the Reef. The village was placed on its present site ten years prior to this period of 1835-'36.

Such, briefly and succinctly, is the sum and the substance of all information which I could gather prior to 1835-'36; and while I do not entirely credit these statements, yet the earnest, straightforward agreement of the natives has impressed me so that I narrate it here. It certainly seems as though this enumeration of the old Aleuts was painfully short.

Then, again, with regard to the probable truth of the foregoing statement of the natives, perhaps I should call attention to the fact that the entire sum of seal-life in 1836, as given by them, is just 4,100, of all classes, distributed as I have indicated above. Now, on turning to Bishop Veniaminov, by whom was published the only statement of any kind in regard to the killing on these islands from 1817 to 1837, the year when he finished his work,* I find that he makes a record of slaughter of seals in the year 1836, of 4,052, which were killed and taken for their skins; but if the natives' statements are right, then only 50 seals were left on the island for 1837, in which year, however, 4,220 were again killed, according to the bishop's table, according to which there was also a steady increase in the size of this return from that date along up to 1850, when the Russians governed their catch by the market alone, always having more seals than they knew what to do with.

Again, in this connection, the natives say that until 1847, the practice on these islands was to kill indiscriminately both females and males for skins; but after this year, 1847, the strict respect now paid to the breeding-seals, and exemption of all females, was enforced for the first time, and has continued up to date.

Thus it will be seen that there is, frankly stated, nothing to guide to a fair or even an approximate estimate as to the numbers of the fur-seals on these two islands, prior to my labor.

MANNER OF COMPUTING THE NUMBER OF SEALS.—After a careful study of the subject, during three entire consecutive seasons, and a confirmatory review of it in 1876, I feel confident that the following figures and surveys will, upon their own face, speak authoritatively as to their truthful character.

At the close of my investigation, during the first season of my labor on the ground, in 1872, the fact became evident that the breeding-seals obeyed implicitly an imperative and instinctive natural law of distribution; a law recognized by each and every seal upon the rookeries, prompted by a fine consciousness of necessity to its own well-being. The breeding-grounds occupied by them were, therefore, invariably covered by the seals in exact ratio, greater or less, as the area upon which they rested was larger or smaller. They always covered the ground evenly, never crowding in at one place here, to scatter out there. The seals lie just as thickly together, where the rookery is boundless in its eligible area to their rear and unoccupied by them, as they do in the little strips which are abruptly cut off and narrowed by rocky walls behind. For instance, on a rod of ground, under the face of bluffs which hemmed it in to the land from the sea, there are just as many seals, no more and no less, as will be found on any other rod of rookery-ground throughout the whole list, great and small; always exactly so many seals, under any and all circumstances, to a given area of breeding-ground. There are just as many cows, bulls, and pups on a square rod at Nah Speel, near the village, where, in 1874, all told, there were only seven or eight thousand, as there are on any square rod at Northeast point, where a million of them congregate.

This fact being determined, it is evident that, just in proportion as the breeding-grounds of the fur-seal on these islands expand or contract in area from their present dimensions, the seals will increase or diminish in number.

* Zapieskie o Ononashkenskaho Otdayla, St. Petersburg, 1842.

The discovery, at the close of the season of 1872, of this law of distribution, gave me at once the clue I was searching for, in order to take steps by which I could arrive at a sound conclusion as to the entire number of seals herding on the island.

I noticed, and time has confirmed my observation, that the period for taking these boundaries of the rookeries, so as to show this exact margin of expansion at the week of its greatest volume, or when they are as full as they are to be for the season, is between the 10th and 20th of July every year; not a day earlier, and not many days later. After the 20th of July the regular system of compact, even organization breaks up. The seals then scatter out in pods or clusters, the pups leading the way, straying far back—the same number instantly covering twice and thrice as much ground as they did the day or week before, when they lay in solid masses and were marshaled on the rookery-ground proper.

There is no more difficulty in surveying these seal-margins during this week or ten days in July, than there is in drawing sights along and around the curbs of a stone-fence surrounding a field. The breeding-seals remain perfectly quiet under your eyes all over the rookery, and almost within your touch, everywhere on the outside of their territory that you may stand or walk. The margins of massed life, as I have indicated on the topographical surveys of these breeding-grounds of St. Paul and St. George, are as clean cut and as well defined against the soil and vegetation, as is the shading on my maps. There is not the least difficulty in making the surveys, and in making them correctly.

Now, with a knowledge of the superficial area of these breeding-grounds, the way is clearly open to a very interesting calculation as to the number of fur-seals upon them. I am well aware of the fact, when I enter upon this discussion, that I cannot claim perfect accuracy, but, as shadowing my plan of thought and method of computation, I propose to present every step in the processes which have guided me to the result.

ROOKERY-SPACE OCCUPIED BY SINGLE SEALS.—When the adult males and females, fifteen or twenty of the latter to every one of the former, have arrived upon the rookery, I think an area a little less than two square feet for each female may be considered as the superficial space required by each animal with regard to its size and in obedience to its habits; and this limit may safely be said to be over the mark. Now, every female, or cow, on this two square feet space, doubles herself by bringing forth her young; and in a few days or a week, perhaps, after its birth, the cow takes to the water to wash and feed, and is not back on this allotted space one-fourth of the time again during the season. In this way, is it not clear that the females almost double their number on the rookery-grounds, without causing the expansion of the same beyond the limits that would be actually required, did they not bear any young at all? For every 100,000 breeding-seals, there will be found more than 85,000 females, and less than 15,000 males; and in a few weeks after the landing of these females, they will show for themselves; that is, for this 100,000, fully 180,000 males, females, and young instead, on the same area of ground occupied previously to the birth of the pups.

It must be borne in mind, that perhaps 10 or 12 per cent. of the entire number of females were yearlings last season, and come up on to these breeding-grounds as virgins for the first time during this season—as two-year old cows; they of course bear no young.

The males being treble and quadruple the physical bulk of the females, require about four feet square for their use of this same rookery-ground, but as they are less than one-fifteenth the number of the females, much less, in fact, they therefore occupy only one-eighth of the space over the breeding-ground, where we have located the supposed 100,000; this surplus area of the males is also more than balanced and equalized by the 15,000 or 20,000 virgin females which come on to this rookery for the first time to meet the males. They come, rest a few days or a week, and retire, leaving no young to show their presence on the ground.

Taking all these points into consideration, and they are features of fact, I quite safely calculate upon an average of two square feet to every animal, big and little, on the breeding-grounds, as the initial point upon which to base an intelligent computation of the entire number of seals before us. Without following this system of enumeration, a person may look over these swarming myriads between Southwest point and Novostoshnal, guessing vaguely and wildly, at any figure from one million up to ten or twelve millions, as has been done repeatedly. How few people know what a million really is; it is very easy to talk of a million, but it is a tedious task to count it off, and makes one's statements as to "millions" decidedly more conservative after the labor has been accomplished.

REVIEW OF THE ROOKERIES OF ST. PAUL.—Before summing up the grand total, I shall now, in sequence, review each one of the several rookeries of St. Paul, taking them in their order as they occur, going north from the Reef point. The accompanying maps show the exact area occupied by the breeding-seals and their young in the season of 1874, which is the date of my latest field-work on the Pribylov islands.

THE REEF ROOKERY.—By reference first to the general map, it will be observed that this large breeding-ground, on that grotesquely-shaped neck which ends in the Reef point, is directly contiguous to the village—indeed, it may be fairly said to be right under the lee of the houses on the hill. It is one of the most striking of all the rookeries, owing probably to the fact that on every side it is sharply and clearly exposed to the vision, as the circuit is made in boats. A reach of very beautiful drifting sand, a quarter of a mile from the village hill to the Reef bluffs, separates the breeding-grounds proper from the habitations of the people. These Zoltai sands are, however,

a famous rendezvous for the "holluschickie", and from them, during the season, the natives make regular drives, having only to step out from their houses in the morning and walk but a few rods to find their fur-bearing quarry.

Passing over the sands on our way down to the point, we quickly come to a basaltic ridge or back-bone, over which the sand has been rifted by the winds, and which supports a rank and luxuriant growth of the *Elymus* and other grasses, with beautiful flowers. A few hundred feet farther along our course brings us in full view, as we look to the south, of one of the most entrancing spectacles which seals afford to man. We look down upon and along a grand promenade-ground, which slopes gently to the eastward, and trends southward down to the water from the abrupt walls bordering on the sea on the west, over a parade-plateau as smooth as the floor of a ball-room, 2,000 feet in length, from 500 to 1,000 feet in width, over which multitudes of "holluschickie" are filing in long strings, or deploying in vast platoons, hundreds abreast, in an unceasing march and counter-march; the breath which rises into the cold air from a hundred thousand hot throats hangs like clouds of white steam in the gray fog itself; indeed, it may be said to be a seal-fog peculiar to the spot, while the din, the roar arising over all, defies our description.

We notice to our right and to our left, the immense solid masses of the breeding-seals at Gorbotch, and those stretching and trending around nearly a mile from our feet, far around to the Reef point below and opposite the parade-ground, with here and there a neutral passage left open for the "holluschickie" to go down and come up from the waves.

The adaptation of this ground of the Reef rookery to the requirements of the seal is perfect. It so lies that it falls gently from its high Zoltoi bay-margin on the west to the sea on the east; and upon its broad expanse not a solitary puddle of mud-spotting is to be seen, though everything is reeking with moisture, and the fog even dissolves into rain as we view the scene. Every trace of vegetation upon this parade has been obliterated; a few tufts of grass, capping the summits of those rocky hillocks, indicated on the eastern and middle slope, are the only signs of botanical life which the seals have suffered to remain.

A small rock, "Seevitchie Kammin," five or six hundred feet right to the southward and out at sea, is also covered with the black and yellow forms of fur-seals and sea-lions. It is environed by shoal-reefs, rough, and kelp-grown, which navigators prudently avoid.

This rookery of the Reef proper has 4,016 feet of sea-margin, with an average depth of 150 feet, making ground for 301,000 breeding-seals and their young. Gorbotch rookery has 3,660 feet of sea-margin, with an average depth of 100 feet, making ground for 183,000 breeding-seals and their young; an aggregate for this great Reef rookery of 484,000 breeding-seals and their young. Heavy as this enumeration is, yet the aggregate only makes the Reef rookery third in importance, compared with the others which we are yet to describe.

LAGOON ROOKERY.—We now pass from the Reef up to the village, where one naturally would not expect to find breeding-seals within less than a pistol-shot from the natives' houses; but it is a fact, nevertheless, for on looking at the sketch map of the Lagoon rookery herewith presented, it will be noticed that I have located a little gathering of breeding-seals right under the village hill to the westward of that place called "Nah Speel". This is in itself an insignificant rookery and never has been a large one, though it is one of the oldest on the island. It is only interesting, however, superficially so, on account of its position, and the fact that through every day of the season half the population of the entire village go and come to the summit of the bluff, which overhangs it, where they peer down for hours at a time upon the methods and evolutions of the "kanticke" below, the seals themselves looking up with intelligent appreciation of the fact that, though they are in the hands of man, yet he is wise enough not to disturb them there as they rest.

If at Nah Speel, or that point rounding into the village cove, there were any suitable ground for a rookery to grow upon or spread over, the seals would doubtless have been there long ago. There are, however, no such natural advantages offered them; what there is they have availed themselves of.

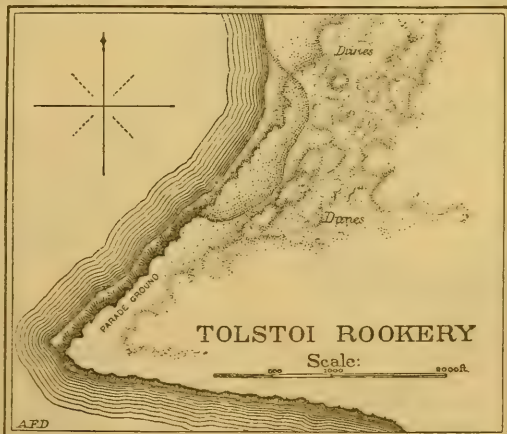
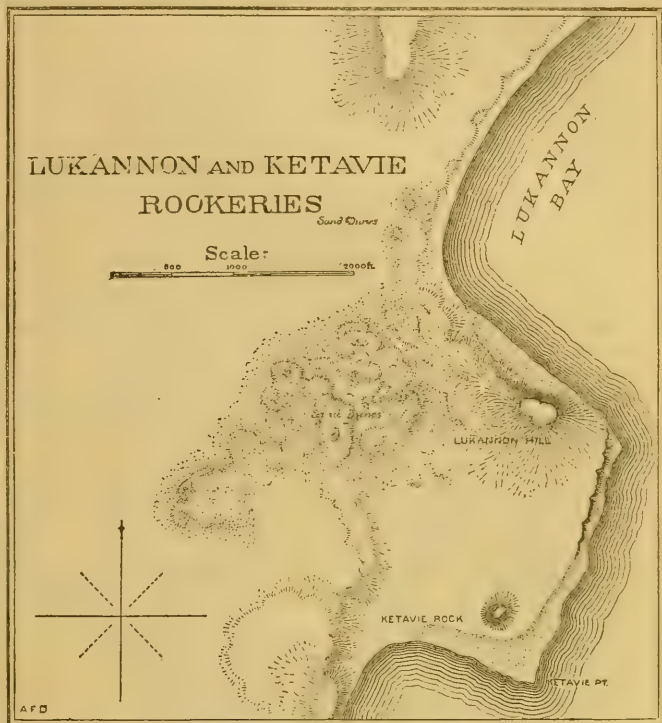


tables, which drop down to a flat that again abruptly descends to the sea at Keetavie point. Between us and the Keetavie rookery is the parade-ground of Lukannon, a sight almost as grand as is that on the Reef which we have feebly attempted to portray. The sand-dunes to the west and to the north are covered with the most luxuriant grass, abruptly emarginated by the sharp abrasion of the hauling-seals: this is shown very clearly on the general map. Keetavie point is a solid basaltic shelf, the summit of it, is composed of volcanic tufa and cement, with irregular cubes and fragments of pure basalt scattered all over its flipper-worn slopes. Lukannon proper has 2,270 feet of sea-margin, with an average depth of 150 feet, making ground for 170,000 breeding-seals and their young. Keetavie rookery has 2,200 feet of sea-margin, with an average depth of 150 feet, making ground for 165,000 breeding-seals and their young, a whole aggregate of 335,000 breeding-seals and their young. This is the point, down along the flat shoals of Lukannon bay, where the sand-dunes are most characteristic, as they rise in their wind-whirled forms just above the surf-wash. This also is where the natives come from the village during the early mornings of the season, for driving, to get any number of "holluschickie".

It is a beautiful sight, glancing from the summit of this great rookery-hill, up to the north over that low reach of the coast to Tonkie Mees, where the waves seem to roll in with crests that rise in unbroken ridges for a mile in length each, ere they break so grandly and uniformly on the beach. In these rollers the "holluschickie" are playing like sea-birds, seeming to sport the most joyously at the very moment when the heavy billow breaks and falls upon them.

TOLSTOI ROOKERY.—Directly to the west from Lukannon, up along and around the head of the Lagoon, is the seal-path road over which the natives bring the "holluschickie" from Tolstoi. We follow this and take up our position on several lofty grass-grown dunes, close to and overlooking another rookery of great size; this is Tolstoi.

We have here the greatest hill-slope of breeding-seals, on either island, peculiarly massed on the abruptly sloping flanks of Tolstoi ridge, as it falls to the sands of English bay, and ends suddenly in the precipitous termination of its own name, Tolstoi point. Here the seals are in some places crowded up to the enormous depth of 500 measured feet, from the sea-margin of the rookery to its outer boundary and limitation; and, when viewed as I viewed it in July, taking the angles and lines shown on the accompanying sketch-map, I considered it, with the bluffs terminating it at the south, and its bold sweep, which ends on the sands of English bay, to be the most picturesque, though it is not the most impressive, rookery on the island—especially when that parade-ground, lying just back and over the point and upon its table-rock surface, is reached by the climbing seals.



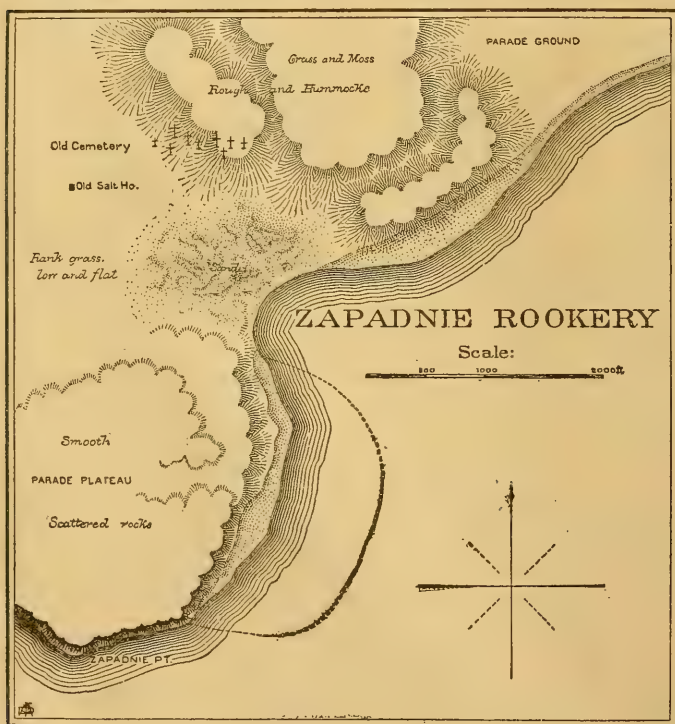
If the observer will glance at the map, he will see that the parade-ground in question lies directly over and about 150 feet above, the breeding-seals immediately under it. The sand-dune tracts which border the great body of the rookery seem to check the "holluschickie" from hauling to the rear, for sand drifts here, in a locality so high and exposed to the full force of the wind, with more rapidity and consequently more disagreeable energy to the seals than anywhere else on the island.

A comical feature of this rookery is the appearance of the foxes in the chinks under the parade-ground and interstices of the cliffs; their melancholy barking and short yelps of astonishment, as we walk about, contrast quite sensibly with the utter indifference of the seals to our presence.

From Tolstoi at this point, sweeping around three miles to Zapadnie, is the broad sand-reach of English bay, upon which and back over its gently rising flats are the great hauling-grounds of the "holluschickie", which I have indicated on the general map, and to which I made reference in a previous section of this chapter. Looking at the myriads of "bachelor-seals" spread out in their restless hundreds and hundreds of thousands upon this ground, one feels the utter impotency of verbal description, and reluctantly shuts his note- and sketch-books to gaze upon it with renewed fascination and perfect helplessness.

Tolstoi rookery has attained, I think, its utmost limit of expansion. The seals have already pushed themselves as far out upon the sand at the north as they can or are willing to go, while the abrupt cliffs, hanging over more than one-half of the sea-margin, shut out all access to the rear for the breeding-seals. The natives said that this rookery had increased very much during the last four or five years prior to the date of my making the accompanying survey. If it continues to increase, the fact can be instantly noted, by checking off the ground and comparing it with the sketch-map herewith presented. Tolstoi rookery has 3,000 feet of sea-margin, with an average depth of 150 feet, making ground for 225,000 breeding-seals and their young.

ZAPADNIE ROOKERY.—From Tolstoi, before going north, we turn our attention directly to Zapadnie on the west, a little over two miles as the crow flies, across English bay, which lies between them. Here again we find another



magnificent rookery, with features peculiar to itself, consisting of great wings separating, one from the other, by a short stretch of five or six hundred feet of the shunned sand-reach which makes a landing and a beach just between them. The northern Zapadnie lies mostly on the gently sloping, but exceedingly rocky, flats of a rough volcanic ridge which drops there to the sea; it, too, has an approximation to the Tolstoi depth, but not to such a solid extent; it is the one rookery which I have reason to believe has sensibly increased since my first survey in 1872. It has overflowed from the boundary which I laid down at that time, and has filled up for nearly half a mile, a long ribbon-like strip of breeding-ground to the northeast from the hill-slope, ending at a point where a few detached rocks jut out, and the sand takes exclusive possession of the rest of the coast. These rocks aforesaid are called by the natives "Nearhpahskie kammin", because it is a favorite resort for the hair-seals. Although this extension of a very decided margin of breeding-ground, over half a mile in length, between 1872 and 1876, does not, in the aggregate,

point to a very large increased number, still it is a gratifying evidence that the rookeries, instead of tending to diminish in the slightest, are more than holding their own.

Zapadnie, in itself, is something like the Reef plateau on its eastern face, for it slopes up gradually and gently to the parade-plateau on top—a parade-ground not so smooth, however, being very rough and rocky, but which the

seals enjoy. Just around the point, a low reach of rocky bar and beach connects it with the ridge-walls of Southwest point: a very small breeding-rookery, so small that it is not worthy of a survey, is located here; I think, probably, on account of the nature of the ground, that it will never hold its own, and is more than likely abandoned by this time.

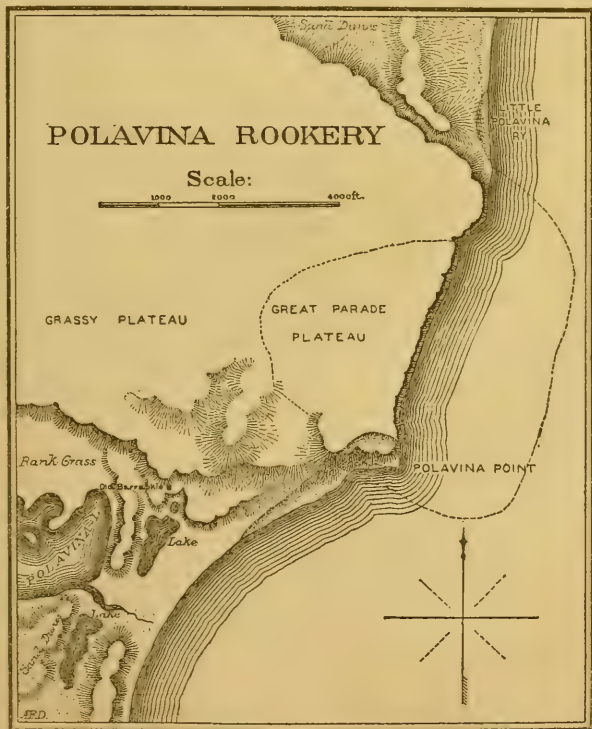
One of the prehistoric villages, the village of Pribylov's time, was established here between the point and the cemetery ridge, on which the northern wing of Zapadni rests. The old burying-ground, with its characteristic Russian crosses and faded pictures of the saints, is plainly marked on the ridge. It was at this little bight of sandy landing that Pribylov's men first came ashore and took possession of the island, while others in the same season proceeded to Northeast point and to the north shore, to establish settlements of their own order. When the indiscriminate sealing of 1868 was in progress, one of the parties lived here, and a salt-house which was then erected by them still stands; it is in a very fair state of preservation, although it has never been since occupied, except by the natives who come over here from the village in the summer to pick the berries of the *Empetrum* and *Rubus*, which abound in the greatest profusion around the rough and rocky flats that environ the little adjacent lake. The young people of St. Paul are very fond of this berry-festival, so-called among themselves, and they stay here every August, camping out, a week or ten days at a time, before returning to their homes in the village.

Zapadni rookery has, the two wings included, 5,880 feet of sea-margin, with an average depth of 150 feet, making ground for 441,000 breeding-seals and their young, being the second rookery on the island as to size and importance.

The "holluschickie" that sport here on the parade-plateau, and indeed over all of the western extent of the English bay hauling-grounds, have never been visited by the natives for the purpose of selecting killing drives since 1872, inasmuch as more seals than were wanted have always been procured from Zoltoi, Lukannon, and Lower Tolstoi points, which are all very close to the village. I have been told, since making this survey, that during the past year the breeding-seals of Zapadni have overflowed, so as to occupy all of the sand-strip which is vacant between them on the accompanying map.

POLAVINA ROOKERY.—Half-way between the village and Northeast point lies Polavina, another one of the seven large breeding-grounds on this island. The conspicuous cone-shaped head of Polavina Sopka rises clearly cut and smooth from the plateau at its base, which falls two miles to the eastward and southeastward, sharp off into the sea, presenting a bluff margin over a mile in length, at the base of which the sea thunders incessantly. It exhibits a very beautiful geological section of the simple structure of St. Paul. The ringing, iron-like basaltic foundations of the island are here setting boldly up from the sea to a height of 40 or 50 feet—black and purplish-red, polished like ebony by the friction of the surf, and worn by its agency into grotesque arches, tiny caverns, and deep fissures. Surmounting this lava-bed is a cap of ferruginous cement and tufa from three to ten feet in thickness, making a reddish floor, upon which the seals patter in their restless, never-ceasing, evolutions, sleeping or waking, on the land. It is as great a single parade-plateau of polished cement as that of the Reef, but we are unable from any point of observation to appreciate it, inasmuch as we cannot stand high enough to overlook it, unless we ascend Polavina Sopka, and then the distances, with the perspective fore-shortening, destroy the effect.

The rookery itself occupies only a small portion of the seal-visited area at this spot. It is placed at the southern termination, and gentle sloping of the long reach of bluff wall, which is the only cliff between Lukannon and Novastoshnah. It presents itself to the eye, however, in a very peculiar manner, and with great scenic effect, when the observer views it from the extreme point of its mural elevation; viewed from thence, nearly a mile to the northwest, it rises as a front of bicolored lava-wall, high above the sea that is breaking at its



base, and is covered with the infinite detail of massed seals in reproduction: at first sight, one wonders how they got there. No passages whatever can be seen, down or up. A further survey, however, discloses the common occurrence of rain-water runs between surf-beaten crevices, which make many stairways for the adhesive feet of *Callorhinus* amply safe and comfortable.

For the reason cited in a similar example at Zapadni, no "holluschickie" have been driven from this point since 1872, though it is one of the easiest worked. It was in the Russian times a pet sealing-ground with them. The remains of the old village have nearly all been buried in the sand near the lake, and there is really no mark of its early habitation, unless it be the singular effect of a human grave-yard being dug out and despoiled by the attrition of seal bodies and flippers. The old cemetery just above and to the right of the barrabkie, near the little lake, was originally established, so the natives told me, far away from the hauling of the "holluschickie"; it was, when I saw it in 1876, in a melancholy state of ruin—a thousand young seals at least moved off from its surface as I came up, and they had actually trampled out many sandy graves, rolling the bones and skulls of Aleutian ancestry in every direction. Beyond this old barrabkie, which the present natives established as a house of refuge during the winter when they were trapping foxes, looking to the west over the lake, is a large expanse of low, flat swale and tundra, which is terminated by the rocky ridge of Kamiusta; every foot of it has been placed there subsequent to the original elevation of the island by the action of the sea, beyond all question. It is covered with a thick growth of the rankest sphagnum, which quakes and trembles like a bog under one's feet, but over which the most beautiful mosses ever and anon crop out, including the characteristic floral display before referred to in speaking of the island; most of the way from the village up to Northeast point, as will be seen by a cursory glance at the map, with the exception of this bluff of Polavina and the terraced table setting back from its face to Polavina Sopka, the whole island is slightly elevated above the level of the sea, and its coast-line is lying just above and beyond the reach of the surf, where great ledges of sand have been piled up by the wind, capped with sheafs and tufts of rank-growing *Elymus*.

There is a small rookery, which I call "Little Polavina", indicated here, which does not promise much for the future; the sand cuts it off on the north, and sand has blown around so at its rear, as to make all other ground not now occupied by the breeding-seals there quite ineligible. Polavina rookery has 4,000 feet of sea-margin, including Little Polavina, with 150 feet of average depth, making ground for 300,000 breeding-seals and their young.

NORTHEAST POINT OR NOVASTOSHINAH ROOKERY.—Though this is the last of the St. Paul rookeries which I notice, yet it is so much greater than any other one on the island, or two others for that matter, that it forms the central feature of St. Paul, and in truth presents a most astonishing and extraordinary sight. It was a view of such multitudes of amphibians, when I first stood upon the summit of Hutchinson hill, and looked at the immense spread around me, that suggested to my mind a doubt whether the accurate investigation which I was making would give me courage to maintain the truth in regard to the subject.

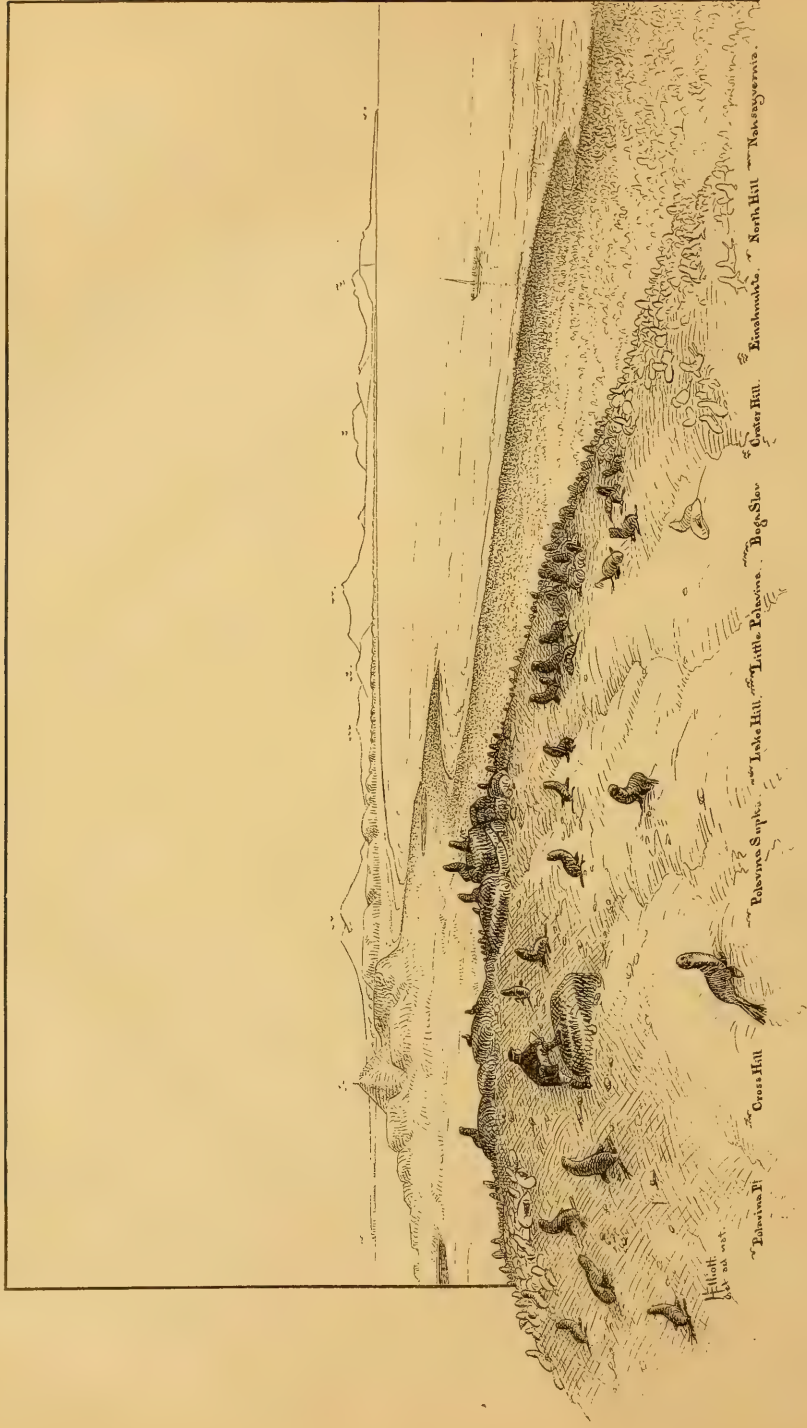
The result of my first survey here presented such a startling array of superficial area massed over by the breeding-seals, that I was fairly disconcerted at the magnitude of the result. It troubled me so when my initial plottings were made, and I had worked them out so as to place them tangibly before me, that I laid the whole preliminary survey aside, and seizing upon the next favorable day went over the entire field again. The two plats then, laid side by side, substantially agreed, and I now present the great rookery to the public. It is in itself, as the others are, endowed with its own particular physiognomy, having an extensive sweep, everywhere surrounded by the sea, except at that intersection of the narrow neck of sand which joins it to the main island. Hutchinson hill is the foundation of the point—a solid basaltic floor, upon which a mass of breccia has been poured at its northwest corner, which is so rough, and yet polished so highly by the countless pattering flippers of its visitors, as to leave it entirely bare and bald of every spear of grass or trace of cryptogamic life. The hill is about 120 feet high; it has a rounded summit flecked entirely over by the "holluschickie", while the great belt of breeding-rookery sweeps high up on its flanks, and around right and left, for nearly three and a half miles unbroken—an amazing sight in its aggregate, and infinite in its detail.

The picturesque feature, also, of the rookery here, is the appearance of the tawny, yellowish bodies of several thousand sea-lions, which lay in and among the fur-seals at the several points designated on the sketch-map, though never far from the water. Sea-Lion neck, a little tongue of low basaltic jutting, is the principal corner where the natives take these animals from when they capture them in the fall for their hides and sinews.*

Cross, or St. John's, hill, which rises near the lake, to a height of 60 or 70 feet, and is quite a land-mark itself, is a perfect cone of sand entirely covered with a luxuriant growth of *Elymus*; it is growing constantly higher by the fresh deposit brought by wind, and its retention by the annually rising grasses.

At this point, it will be noticed, there is a salt-house, and here is the killing-ground for Northeast point, where nineteen or twenty thousand "holluschickie" are disposed of for their skins every season; their carcasses being spread out on the sand-dunes between the foot of Cross hill and Webster's house; a squad of sealers live there during the

*The sea-lions breed on no one of the other rookeries at this island, the insignificant number that I noticed on Seevitchie Kammiss excepted. At Southwest point, however, I found a small sea-lion rookery, but there are no breeding fur-seals there. A handful of *Eumotopias* used to breed on Otter island, but do not now, since it has been necessary to station government agents there, for the apprehension of fur-seal pirates, during the sealing season.



THE NORTH SHORE OF ST. PAUL ISLAND.

Viewed from the summit of Hutchinson's Hill, looking W. S. W. over a portion of the Great Novasiosnah Rookery.

three or four weeks that they are engaged in the work. The "holluschickie" are driven from the large hauling-grounds on the sand-flats immediately adjacent to the killing-grounds, being obtained without the slightest difficulty.

Here also was the site of a village, once the largest one on this island ere its transfer to the sole control and charge of the old Russian-American Company, ten years after its discovery in 1787. The ancient cemetery and the turf lines of the decayed barraboras are still plainly visible.

The company's steamer runs up here, watching her opportunity, and drops her anchor, as indicated on the general chart, right south of the salt-house, in about four fathoms of water; and the skins are invariably hustled aboard, no time being lost, because it is an exceedingly uncertain place to safely load the vessel.

There is no impression in my mind really more vivid, than is the one which was planted there during the afternoon of that July day, when I first made my survey of this ground; indeed, whenever I pause to think of the subject, the great rookery of Novastoshnah rises promptly to my view, and I am fairly rendered dumb when I try to speak in definition of the spectacle. In the first place, this slope from Sea Lion neck to the summit of Hutchinson's hill

is a long mile, smooth and gradual from the sea to the hill-top; the parade ground lying between is also nearly three-quarters of a mile in width, sheer and unbroken. Now, upon that area before my eyes, this day and date of which I have spoken, were the forms of not less than three-fourths of a million seals—pause a moment—think of the number—three-fourths of a million seals moving in one solid mass from sleep to frolicsome gambols, backward, forward, over, around, changing and interchanging their heavy squadrons, until the whole mind is so confused and charmed by the vastness of mighty hosts that it refuses to analyze any further. Then, too, I remember that the day was one of exceeding beauty for that region; it was a swift alternation over head of those characteristic rain fogs, between the succession of which the sun breaks out with transcendent brilliancy through the misty halos about it; this parade-field reflected the light like a mirror, and the seals, when they broke apart here and there for a moment, just enough to show its surface, seemed as though they walked upon the water. What a scene to put upon canvas—that amphibian host involved in those alternate rainbow lights and blue-gray shadows of the fog!

RECAPITULATION OF THE ESTIMATES OF NUMBER OF SEALS.—Below is a recapitulation of these figures made from my surveys of the area and position of the breeding-grounds of St. Paul island, between the 10th and 18th of July, 1872, confirmed and revised to that date in 1874. It is the first survey ever made on the island of its rookeries:



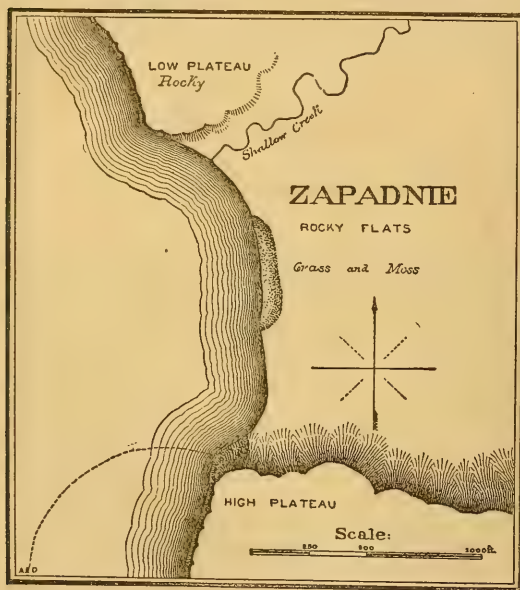
Breeding-grounds of the fur-seal, on St. Paul island.

	Number of seals, male, female, and young.
"Reef rookery" has 4,016 feet of sea-margin, with 150 feet of average depth, making ground for.....	301,000
"Gorbotch rookery" has 3,660 feet of sea-margin, with 100 feet of average depth, making ground for.....	183,000
"Lagoon rookery" has 750 feet of sea-margin, with 100 feet of average depth, making ground for.....	37,000
"Nah Speel rookery" has 400 feet of sea-margin, with 40 feet of average depth, making ground for.....	8,000
"Lukannon rookery" has 2,270 feet of sea margin, with 150 feet of average depth, making ground for.....	170,000
"Ketavio rookery" has 2,200 feet of sea-margin, with 150 feet of average depth, making ground for.....	165,000
"Tolstoi rookery" has 3,000 feet of sea margin, with 150 feet of average depth, making ground for.....	225,000
"Zapadni rookery" has 5,880 feet of sea-margin, with 150 feet of average depth, making ground for.....	441,000
"Polavina rookery" has 4,000 feet of sea-margin, with 150 feet of average depth, making ground for.....	300,000
"Novastoshnah, or Northeast point" has 15,840 feet of sea-margin, with 150 feet of average depth, making ground for....	1,200,000
A grand total of breeding-seals and young for St. Paul island in 1874 of.....	3,030,000

ST. GEORGE.—St. George is now in order, and this island has only a trifling contribution for the grand total of the seal-life; but small as it is, it is of much value and interest. Certainly Pribylov, not knowing of the existence of St. Paul, was as well satisfied as if he had possessed the boundless universe, when he first found it. As in the case of St. Paul island, I have been unable to learn much here in regard to the early status of the rookeries, none of the natives having any real information. The drift of their sentiment goes to show that there never was a great assemblage of fur-seals on St. George; in fact, never as many as there are to-day, insignificant as the exhibit is, compared with that of St. Paul. They say that, at first, the sea-lions owned this island, and that the Russians, becoming cognizant of the fact, made a regular business of driving off the "seevitchie", in order that the fur-seals might be encouraged to land. Touching this statement, with my experience on St. Paul, where there is no conflict at all between the fifteen or twenty thousand sea-lions which breed around on the outer edge of the seal-rookeries there, and at Southwest point, I cannot agree to the St. George legend. I am inclined to believe, however, indeed it is more than probable, that there were a great many more sea-lions on and about St. George before it was occupied by men—a hundred-fold greater, perhaps, than now; because, a sea-lion is an exceedingly timid, cowardly creature when it is in the proximity of man, and will always desert any resting place where it is constantly brought into contact with him.*

The scantiness of the St. George rookeries, is due to the configuration of the island itself.† There are five separate, well-defined rookeries on St. George, as follows:—

ZAPADNIE ROOKERY.—Directly across the island, from its north shore to Zapadnie bay, a little over three



miles from the village, is a point where the southern bluff-walls of the island turn north, and drop quickly down from their lofty elevation in a succession of heavy terraces, to an expanse of rocky flat, bordered by a sea sand-beach; just between the sand beach, however, and these terraces, is a stretch of about 2,000 feet of low, rocky shingle, which borders the flat country back of it, and upon which the surf breaks free and boldly. Midway between the two points is the rookery; and a small detachment of it rests on the direct sloping of the bluff itself, to the southward; while in and around the rookery, falling back to some distance, the "hol-luschickie" are found.

A great many confusing statements have been made to me about this rookery—more than in regard to any other on the islands. It has been said, with much positiveness, that, in the times of the Russian rule, this was an immense rookery for St. George; or, in other words, it covered the entire ground between that low plateau to the north and the high plateau to the south, as indicated on the map; and it is also cited in proof of this that the main village of the island, for many years, thirty or forty, was placed on or near the limited drifting sand-dune tracts just above the plateau, to the westward. Be the case as it may, it is certain that for a great, great many years back, no such rookery has

ever existed here. When seals have rested on a chosen piece of ground to breed, they wear off the sharp edges of fractured basaltic boulders, and polish the breccia and cement between them so thoroughly and so finely that years and years of chiseling by frost, and covering by lichens, and creeping of mosses, will be required to efface that record. Hence I was able, acting on the suggestion of the natives at St. Paul, to trace out those deserted fur-seal rookeries

* This statement of the natives has a strong circumstantial backing by the published account of Choris, a French gentleman of leisure, and amateur naturalist and artist, who landed at St. George in 1820 (July); he passed several days off and on the land; he wrote at short length in regard to the sea-lion, saying "that the shores were covered with innumerable troops of sea-lions. The odor which arose from them was insupportable. These animals were all the time rutting", etc., yet nowhere does he speak in the chapter, or elsewhere in his volume, of the fur-seal on St. George, but incidentally remarks that over on St. Paul it is the chief animal and most abundant.—*Voyage Pittoresque au tour du Monde, Les Aloutiennes*, pp. 12, 13, pl. xiv. 1822.

Although this writing of Choris in regard to the subject is brief, superficial, and indefinite, yet I value the record he made, because it is *prima facie* evidence, to my mind, that had the fur-seal been nearly as numerous on St. George then as it was on St. Paul, he would have spoken of the fact surely, inasmuch as he was searching for just such items with which to illuminate his projected book of travels. The old Russian record as to the relative number of fur-seals on the two islands of St. George and St. Paul is clearly as palpably erroneous for 1820, as I found it to be in 1872, 1873. No intelligent steps toward ascertaining that ratio were ever taken until I made my survey.

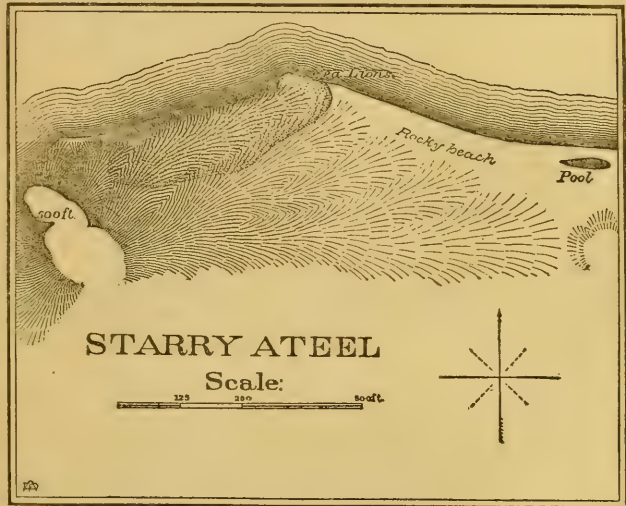
on the shores of that island. At Maroonitch, which had, according to their account, been abandoned for over sixty years by the seals, still, at their prompting, when I searched the shore, I found the old boundaries tolerably well defined; I could find nothing like them at Zapadnie.

Zapadnie rookery in July, 1873, had 600 feet of sea-margin, with 60 feet of average depth; making ground for 18,000 breeding-seals and their young. In 1874, I resurveyed the field and it seemed very clear to me that there had been a slight increase, perhaps to the number of 5,000, according to the expansion of the superficial area over that of 1873.

From Zapadnie we pass to the north shore, where all the other rookeries are located, with the village at a central point between them on the immediate border of the sea. And, in connection with this point, it is interesting to record the fact that every year, until recently, it has been the regular habit of the natives to drive the "holluschickie" over the two and a half or three miles of rough basaltic uplands which separate the hauling-ground of Zapadnie from the village; driving them to the killing-grounds there, in order to save the delay and trouble generally experienced in loading these skins in the open bay. The prevailing westerly and northwesterly winds during July and August, make it, for weeks at a time, a marine impossibility to effect a landing at Zapadnie, suitable for the safe transit of cargo to the steamer.

This three miles of the roughest of all rough walks that can be imagined, is made by the fur-seals in about seven or eight hours, when driven by the Aleuts; and, the weather is cool and foggy. I have known one treasury agent, who, after making the trip from the village to Zapadnie, seated himself down in the barrabkie there, and declared that no money would induce him to walk back the same way that same day—so severe is the exercise to one not accustomed to it; but it exhibits the power of land-locomotion possessed by the "holluschickie".*

STARRY ATEEL†.—This rookery is the next in order, and it is the most remarkable one on St. George, lying as it does in a bold sweep from the sea, up a steeply inclined slope to a point where the bluffs bordering it seaward are over 400 feet high; the seals being just as closely crowded at the summit of this lofty breeding plat as they are at the water's edge; the whole oblong oval on the side hill, as designated by the accompanying survey, is covered by their thickly clustered forms. It is a strange sight also, to sail under these bluffs with the boat, in fair weather, for a landing; and, as you walk the beach, over which the cliff wall frowns a sheer 500 feet, there, directly over your head the craning necks and twisting forms of the restless seals, ever and anon, as you glance upward, appear as if ready to launch out and fall below, so closely and boldly do they press the very edge of the precipice.‡ There is a low, rocky beach to the

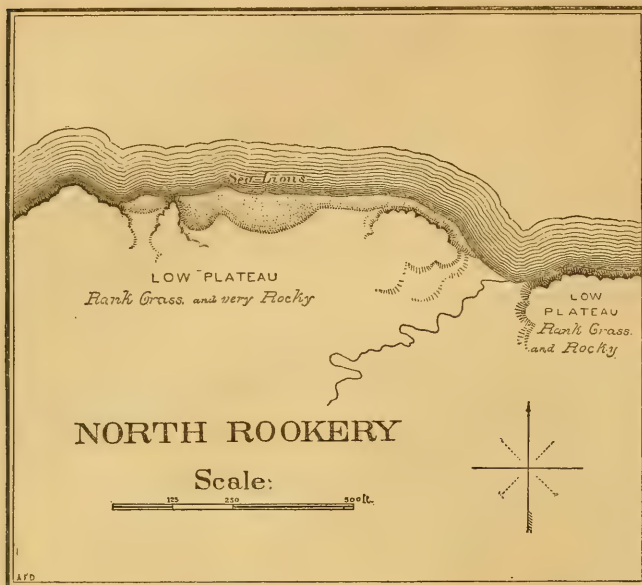


* The peculiarly rough character to this trail is given by the large, loose, sharp-edged basaltic boulders, which are strewn thickly over all those lower plateau that bridge the island between the high bluffs at Starry Ateel and the slopes of Ahlukeyak hill. The summits of the two broader, higher plateaus, east and west respectively, are comparatively smooth and easy to travel over; and so is the sea-level flat at Zapadnie itself. On the map of St. George, a number of very small ponds will be noticed; they are the fresh-water reservoirs of the island. The two largest of these are near the summit of this rough divide; the seal-trail from Zapadnie to the village runs just west of them, and comes out on the north shore, a little to the eastward of the hauling-grounds of Starry Ateel, where it forks and unites with that path. The direct line between the village and Zapadnie, though nearly a mile shorter on the chart, is equal to 5 miles more of distance by reason of its superlative rocky inequalities.

† "Starry Ateel" or "Old Settlement"; a few hundred yards to the eastward of the rookery, is the earthen ruins of one of the pioneer settlements in Pribylov's time, and which, the natives say, marks the first spot selected by the Russians for their village after the discovery of St. George, in 1786.

‡ I have been repeatedly astonished at the amazing power possessed by the fur-seal, of resistance to shocks which would certainly kill any other animal. To explain clearly, the reader will observe, by reference to the maps, that there are a great many cliffy places between the rookeries on the shore-lines of the islands. Some of these cliffs are more than 100 feet in abrupt elevation above the surf and rocks awash below. Frequently "holluschickie", in ones, or twos, or threes will stray far away back from the great masses of their kind, and fall asleep in the thick grass and herbage which covers these mural reaches. Sometimes they will lie down and rest very close to the edge, and then as you come tramping along you discover and startle them and yourself alike. They, blinded by their first transports of alarm, leap promptly over the brink, snorting, coughing, and spitting as they go. Curiously peering after them and looking down upon the rocks, 50 to 100 feet below, instead of seeing their stunted and motionless bodies, you will invariably catch sight of them rapidly scrambling into the water; and, when in it, swimming off like arrows from the bow. Three "holluschickie" were thus

eastward of this rookery, over which the "holluschickie" haul in proportionate numbers, and from which the natives make their drives, coming from the village for this purpose, and directing the seals back, in their tracks.* Starry



Ateel has 500 feet of sea and cliff margin, with 125 feet of average depth, making ground for 30,420 breeding-seals and their young.

NORTH ROOKERY.—Next in order, and half a mile to the eastward, is this breeding-ground, which sweeps for 2,750 feet along and around the sea-front of a gently sloping plateau;† being in full sight of and close to the village. It has a superficial area occupied by 77,000 breeding-seals and their young. From this rookery to the village, a distance of less than a quarter of a mile, the "holluschickie" are driven which are killed for their skins, on the common track or seal-worn trail, that, not only the "bachelors" but ourselves travel over *en route* to and from Starry Ateel and Zapadne; it is a broad, hard-packed erosion through the sphagnum, and across the rocky plateaux—in fact a regular seal-road, which has been used by the drivers and victims during the last eighty or ninety years. The fashion on St. George, in this matter of driving seals, is quite different from that

on St. Paul. To get their maximum quota of 25,000 annually, it is necessary for the natives to visit every morning the hauling-grounds of each one of these four rookeries on the north shore, and bring what they may find back with them for the day.

inadvertently surprised by me on the edge of the west face to Otter island. They plunged over from an elevation, there, not less than 200 feet in sheer elevation, and I distinctly saw them fall in scrambling, whirling evolutions, down, thumping upon the rocky shingle beneath, from which they bounded, as they struck, like so many rubber balls. Two of them never moved after the rebound ceased, but the third one reached the water and swam away like a bird on the wing.

While they seem to escape without bodily injury incident to such hard falls as ensue from dropping 50 or 60 feet upon pebbly beaches and rough boulders below, and even greater elevations, yet I am inclined to think that some internal injuries are necessarily sustained in most every case, which soon develop and cause death; the excitement and the vitality of the seal, at the moment of the terrific shock, is able to sustain and conceal the real injury for the time being.

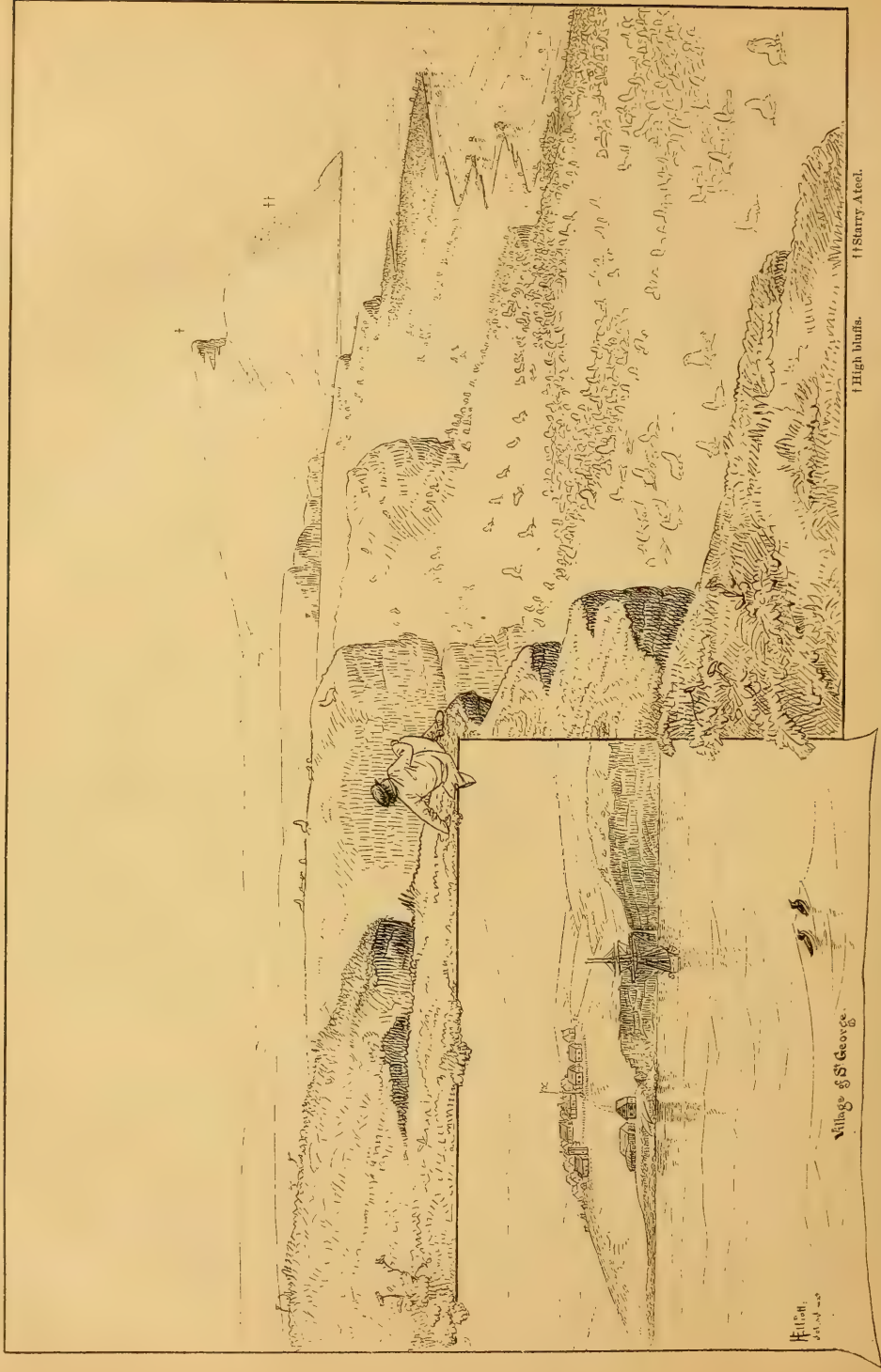
* Driving the "holluschickie" on St. George, owing to the relative scantiness of hauling area for those animals there, and consequent small numbers found upon these grounds at any one time, is a very arduous series of daily exercises on the part of the natives who attend to it. Glancing at the map, the marked considerable distance, over an exceedingly rough road, will be noticed between Zapadne and the village; yet, in 1872, eleven different drives across the island, of 400 to 500 seals each, were made in the short four weeks of that season.

The following table shows plainly the striking inferiority of the seal-life, as to aggregate number, on this island, compared with that of St. Paul:

Rookeries of St. George.	Number of drives made in 1872.	Number of seals driven.
"Zapadne" (between June 14 and July 28)	11	5,194
"Starry Ateel" (between June 6 and July 29)	14	5,274
"North Rookery" (between June 1 and July 27)	16	4,818
"Little Eastern"		
"Great Eastern" (between June 5 and July 28)	16	9,714

The same activity in "sweeping" the hauling-grounds of St. Paul would bring in ten times as many seals, and the labor be vastly less; the driving at St. Paul is generally done with an eye to securing each day of the season only as many as can be well killed and skinned on that day, according as it be warmish or cooler.

† I should say "a gently sloping and alternating bluff plateau"; 2,000 feet are directly under the abrupt faces of low cliffs, while the other 750 feet slope down gradually to the water's edge; these narrow cliff belts of breeding fur-seals might be properly styled "rookery ribbons".

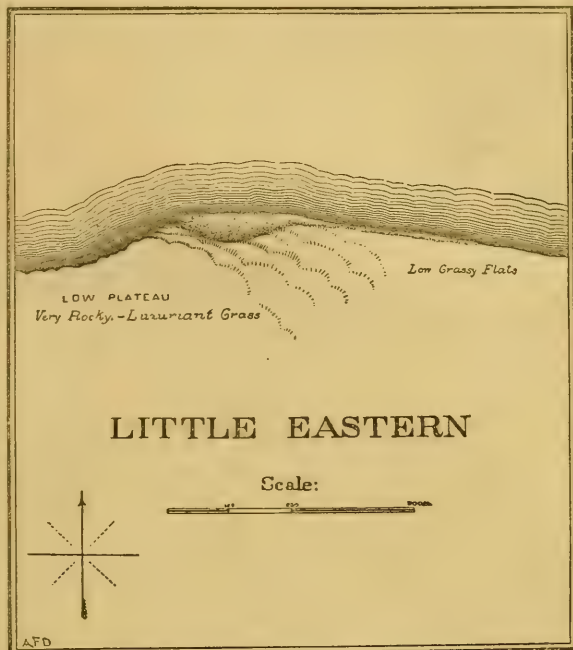


VIEW OF THE NORTH ROOKERY, LOOKING WEST TO STARRY ATEEL.
St. George Island, Pribylov Group.

LITTLE EASTERN ROOKERY.*—From the village to the eastward, about half a mile again, is a little eastern rookery, which lies on a low, bluff slope, and is not a piece of ground admitting of much more expansion. It has superficial area for the reception of nearly 13,000 breeding-seals and their young.

THE GREAT EASTERN.—This is the last rookery that we find on St. George. It is an imitation, in miniature, of Tolstoi on St. Paul, with the exception of there being no parade-ground in the rear, of any character whatever. It is from the summit of the cliffs, overlooking the narrow ribbon of breeding-seals right under them, that I have been able to study the movements of the fur-seal in the water to my heart's content; for out, and under the water, the rocks, to a considerable distance, are covered with a whitish algaoid growth, that renders the dark bodies of the swimming seals and sea-lions as conspicuous as is the image thrown by a magic lantern of a silhouette on a screen prepared for its reception.† The low rocky flats around the pool to the westward and northwest of the rookery seem to be filled up with a muddy alluvial wash that the seals do not favor; hence nothing but "holluschickie" range round about them.

RECAPITULATION.—In recapitulation, therefore, the breeding-grounds on St. George island, according to the surveys which I made between the 12th and 15th of July, 1873, gave the following figures. They are also, as in the case of St. Paul, the first surveys ever made here:



Name of breeding-grounds, July 12-15, 1873.	Seals: ♂ ♀ ○.
"Zapadni rookery" has 600 feet of sea-margin, with 60 feet of average depth, making ground for	18,000
"Starry Ateel" rookery has 500 feet of sea-margin, with 125 feet of average depth, making ground for	30,420
"North rookery" has 750 feet of sea-margin, with 150 feet of average depth, and 2,000 feet of sea-margin, with 25 feet of average depth; making ground in all for	77,000
"Little Eastern" rookery has 750 feet of sea-margin, with 40 feet of average depth, making ground for	13,000
"Great Eastern" rookery has 900 feet of sea-margin, with 60 feet of average depth, making ground for	25,000
A grand total of the seal-life for St. George island, breeding-seals and young, of	163,420
Grand total for St. Paul island, brought forward, breeding-seals and young, of	3,030,000
Grand sum total for the Pribylov islands (season of 1873), breeding-seals and young	3,193,420

The figures above thus show a grand total of 3,193,420 breeding-seals and their young. This enormous aggregate is entirely exclusive of the great numbers of the non-breeding seals, that, as we have pointed out, are never permitted to come up on those grounds which have been surveyed and epitomized by the table just exhibited. That class of seals, the "holluschickie", in general terms, all males, and those to which the killing is confined, come up on the land and sea-beaches between the rookeries, in immense straggling droves, going to and from the sea at

* The site of this breeding-ground and that of the marine slope of the killing-grounds to the east of the village, on this island, is where sea-lions held exclusive possession prior to their driving off by the Russians—so the natives affirm—the only place on St. George now where the *Eumetopias* breeds, is that one indicated on the general chart, between Garden cove and Tolstoi Mees.

† The algaoid vegetation of the marine shores of these islands is one that adds a peculiar charm and beauty to their treeless, sunless coasts. Every kelp bed that floats raft-like in Bering sea, or is anchored to its rocky reefs, is fairly alive with minute sea-shrimps, tiny crabs, and little shells which cling to its masses of interwoven fronds or dart in ceaseless motion through, yet within its interstices. It is my firm belief that no better base of operations can be found for studying marine invertebrata than is the post of St. Paul or St. George; the pelagic and the littoral forms are simply abundant beyond all estimation within bounds of reason. The phosphorescence of the waters of Bering sea surpasses, in continued strength of brilliant illumination, anything that I have seen in southern and equatorial oceans. The crests of the long unbroken line of breakers on Lukannon beach looked to me, one night in August, like an instantaneous flashing of lightning,

irregular intervals, from the beginning to the closing of the entire season. The method of the "holluschickie" on these hauling-grounds is not systematic—it is not distinct, like the manner and law prescribed and obeyed by the breeding-seals, which fill up those rookery-grounds to the certain points as surveyed, and keep these points intact for a week or ten days, at a time, during the height of every season in July and August; but, to the contrary, upon the hauling-grounds to-day, an immense drove of 100,000 will be seen before you at English bay, sweeping hither and surging thither over the polished surface which they have worn with their restless flippers, tracing and retracing their tireless marches; consequently the amount of ground occupied by the "holluschickie" is vastly in excess of what they would require did they conform to the same law of distribution observed by the breeding seals; and this ground is therefore wholly untenable for any such definite basis and satisfactory conclusion as is that which I have surveyed on the rookeries. Hence, in giving an estimate of the aggregate number of "holluschickie" or non-breeding seals, on the Pribylov islands, embracing as it does all the males under six and seven years of age and



all the yearling females, it must, necessarily, be a simple opinion of mine founded upon nothing better than my individual judgment. This is my conclusion:

The non-breeding seals seem nearly equal in number to that of the adult breeding-seals; but without putting them down at a figure quite so high, I may safely say that the sum total of 1,500,000, in round numbers, is a fair enumeration, and quite within bounds of fact. This makes the grand sum total, of the fur-seal life on the Pribylov islands, over 4,700,000.

THE INCREASE OR DIMINUTION OF THE SEAL-LIFE, PAST, PRESENT, AND PROSPECTIVE.—One stereotyped question has been addressed to me universally by my friends since my return, first in 1873, from the seal-islands. The query is: "At the present rate of killing the seals, it will not be long ere they are exterminated; how much longer will they last?" My answer is now as it was then, "Provided matters are conducted on the seal-islands in the future as they are to-day, 100,000 male seals under the age of five years and over one, may be safely taken every year from the Pribylov islands, without the slightest injury to the regular birth-rates, or natural increase thereon; provided, also, that the fur-seals are not visited by any plague, or pests, or any abnormal cause for their destruction, which might be beyond the control of men; and to which, like any other great body of animal life, they must ever be subjected to the danger of."*

LOSS OF LIFE SUSTAINED BY THE YOUNG SEALS.—From my calculations, given above, it will be seen that 1,000,000 pups, or young seals, in round numbers, are born upon these islands of the Pribylov group every year; of this million, one-half are males. These 500,000 young males, before they leave the islands for sea, during October and November, and when they are between five and six months old, fat and hardy, have suffered but a trifling loss in numbers, say one per cent., while on and about the islands of their birth, surrounding which, and upon which, they have no enemies whatever to speak of; but, after they get well down to the Pacific, spread out over an immense area of watery highways in quest of piscatorial food, they form the most helpless of their kind to resist

between Tolsti Mees and Lukannon head, as the billows successively rolled in, and broke; the seals swimming under the water, here on St. George and beneath the Black Bluffs, streaked their rapid course like comets in the sky; and every time their dark heads popped above the surface of the sea, they were marked by a blaze of scintillant light.

* The thought of what a deadly epidemic would effect among these vast congregations of *Pinnepedia* was one that was constant in my mind when on the ground and among them. I have found in the *British Annals* (Fleming's), on page 17, an extract from the notes of Dr. Trail: "In 1833 I inquired for my old acquaintances, the seals of the Hole of Papa Westray, and was informed that about four years before they had totally deserted the island, and had only within the last few months begun to reappear. * * * About fifty years ago multitudes of their carcasses were cast ashore in every bay in the north of Scotland, Orkney, and Shetland, and numbers were found at sea in a sickly state." This note of Trail is the only record which I can find of a fatal epidemic among the seals; it is not reasonable to suppose that the Pribylov rookeries have never suffered from distempers in the past, or are not to, in the future, simply because no occasion seems to have arisen during the comparatively brief period of their human domination.

or elude the murderous teeth and carnivorous attacks of basking sharks* and killer-whales†. By these agencies, during their absence from the islands until their reappearance in the following year, and in July, they are so perceptibly diminished in number that I do not think, fairly considered, more than one-half of the legion which left the ground of their birth, last October, came up the next July to these favorite landing-places; that is, only 250,000 of them return out of the 500,000 born last year. The same statement, in every respect, applies to the going and the coming of the 500,000 female pups, which are identical in size, shape, and behavior.

As yearlings, however, these 250,000 survivors, of last year's birth, have become strong, lithe, and active swimmers; and, when they again leave the hauling-grounds as before, in the fall, they are fully as able as are the older class to take care of themselves; and when they reappear next year, at least 225,000 of them safely return in the second season after birth; from this on I believe that they live out their natural lives of fifteen to twenty years each; the death-rate now caused by the visitation of marine enemies affecting them, in the aggregate, but slightly. And again, the same will hold good touching the females, the average natural life of which, however, I take to be only nine or ten years each.

Out of these 225,000 young males, we are required to save only one-fifteenth of their number to pass over to the breeding-grounds, and meet there the 225,000 young females; in other words, the polygamous habit of this animal is such that, by its own volition, I do not think that more than one male annually out of fifteen born is needed on the breeding-grounds in the future; but in my calculations, to be within the margin and to make sure that I save two-year-old males enough every season, I will more than double this proportion, and set aside every fifth one of the young males in question; that will leave 180,000 seals, in good condition, that can be safely killed every year, without the slightest injury to the perpetuation of the stock itself forever in all its original integrity.‡

In the above showing I have put the very extreme estimate upon the loss sustained at sea by the pup-seals too large, I am morally certain; but, in attempting to draw this line safely, I wish to place the matter in the very worst light in which it can be put, and to give the seals the full benefit of every doubt. Surely I have clearly presented the case, and certainly no one will question the premises after they have studied the habit and disposition of the rookeries; hence, it is a positive and tenable statement, that no danger of the slightest appreciable degree of injury to the interests of the government on the seal-islands of Alaska, exists as long as the present law protecting it, and the management executing it, continues.

COURSE PURSUED BY THE SEALS AFTER LEAVING THE ISLANDS.—These fur-seals of the Pribylov group, after leaving the islands in the autumn and early winter, do not visit land again until the time of their return in the following spring and early summer, to these same rookery- and hauling-grounds, unless they touch, as they are navigating their lengthened journey back, at the Russian Copper, and Bering islands, 700 miles to the westward of the Pribylov group. They leave the islands by independent squads, each one looking out for itself; apparently all turn by common consent to the south, disappearing toward the horizon, and are soon lost in the vast expanse below, where they spread themselves over the entire North Pacific as far south as the 48th and even the 47th parallels of north latitude. Over the immense area between Japan and Oregon, doubtless, many extensive submarine fishing-grounds and banks are known to them; at least, it is definitely understood that Bering sea does

* *Somniosus microcephalus*. Some of these sharks are of very large size, and when caught by the Indians of the northwest coast, basking or asleep on the surface of the sea, they will, if transfixed by the native's harpoons, take a whole fleet of canoes in tow and run swiftly with them several hours before exhaustion enables the savages to finally dispatch them. A Hudson Bay trader, William Manson (at Ft. Alexander, in 1865), told me that his father had killed one in the smooth waters of Millbank sound, which measured 24 feet in length, and its liver alone yielded 36 gallons of oil. The *Somniosus* lays motionless for long intervals in calm waters of the North Pacific, just under and at the surface, with its dorsal fin clearly exposed above; what havoc such a carnivorous fish would be likely to effect in a "pod" of young fur-seals, can be better imagined than described.

† *Orca gladiator*. While revolving this particular line of inquiry in my mind when, on the ground and among the seals, I involuntarily looked constantly for some sign of disturbance in the sea which would indicate the presence of an enemy; and, save seeing a few examples of the *Orca*, I never detected anything; if the killer-whale was common here, it would be patent to the most casual eye, because it is the habit of this ferocious cetacean to swim so closely at the surface as to show its peculiar sharp, dorsal fin high above the water; possibly a very superficial observer could and would confound the long, trenchant fluke of the *Orca* with the stubby node upon the spine of the humpback whale, which that animal exhibits only when it is about to dive. Humpbacks feed around the islands, but not commonly—they are the exception; they do not, however, molest the seals in any manner whatever; and little squads of these pinipeds seem to delight themselves by swimming in endless circles around and under the huge bodies of those whales, frequently leaping out and entirely over the cetacean's back, as witnessed on one occasion by myself and the crew of the "Reliance", off the coast of Kadiak, June, 1874.

‡ When regarding the subject in 1872-73, of how many surplus young males could be wisely taken from the Pribylov stock, I satisfied myself that more than 100,000 could be drawn upon annually for their skins, and hence was impressed with the idea that the business might be safely developed to a greater maximum; since then, however, I have been giving attention to the other side of the question, which involves the market for the skins and the practical working of any sliding scale of increased killing, such as I then recommended. A careful review of the whole matter modifies my original idea and causes me to think that, all things considered, it is better to "let well enough alone". Although it would be a most interesting commercial experiment to develop the yield of the Pribylov islands to their full capacity, yet, in view of the anomalous and curious features of the case, it is wiser to be satisfied with the assured guarantee of perpetuation in all original integrity, which the experience of the last ten years gives us on the present basis of 100,000, than to risk it by possibly doubling the revenue therefrom. Therefore, I am not now in favor of my earlier proposition of gradually increasing the killing, until the maximum number of surplus "holluschickie" should be ascertained.

not contain them long when they depart from the breeding-rookeries and the hauling-grounds therein. While it is carried in mind that they sleep and rest in the water with soundness and with the greatest comfort on its surface, and that even when around the land, during the summer, they frequently put off from the beaches to take a bath and a quiet snooze just beyond the surf, we can readily agree that it is no inconvenience whatever, when the reproductive functions have been discharged, and their coats renewed, for them to stay the balance of the time in their most congenial element—the briny deep.

NATURAL ENEMIES OF THE FUR-SEALS.—That these animals are preyed upon extensively by killer-whales (*Orca gladiator*), in especial, and by sharks, and probably other submarine foes now unknown, is at once evident; for, were they not held in check by some such cause, they would, as they exist to-day on St. Paul, quickly multiply, by arithmetical progression, to so great an extent that the island, nay, Bering sea itself, could not contain them. The present annual killing of 100,000 out of a yearly total of over a million males does not, in an appreciable degree, diminish the seal-life, or interfere in the slightest with its regular, sure perpetuation on the breeding-grounds every year. We may, therefore, properly look upon this aggregate of four and five millions of fur-seals, as we see them every season on these Pribilof islands, as the maximum limit of increase assigned to them by natural law. The great equilibrium, which nature holds in life upon this earth, must be sustained at St. Paul as well as elsewhere.

FOOD CONSUMED BY THE FUR-SEALS.—Think of the enormous food-consumption of these rookeries and hauling-grounds; what an immense quantity of finny prey must pass down their voracious throats as every year rolls by. A creature so full of life, strung with nerves, muscles like bands of steel, cannot live on air, or absorb it from the sea. Their food is fish, to the practical exclusion of all other diet. I have never seen them touch, or disturb with the intention of touching it, one solitary example in the flocks of water-fowl which rest upon the surface of the water all about the islands. I was especially careful in noting this, because it seemed to me that the canine armature of their mouths must suggest flesh for food at times as well as fish; but fish we know they eat. Whole windrows of the heads of cod and wolf fishes,* bitten off by these animals at the nape, were washed up on the south shore of St. George during a gale in the summer of 1873; this pelagic decapitation evidently marked the progress and the appetite of a band of fur-seals to the windward of the island, as they passed into and through a stray school of these fishes.

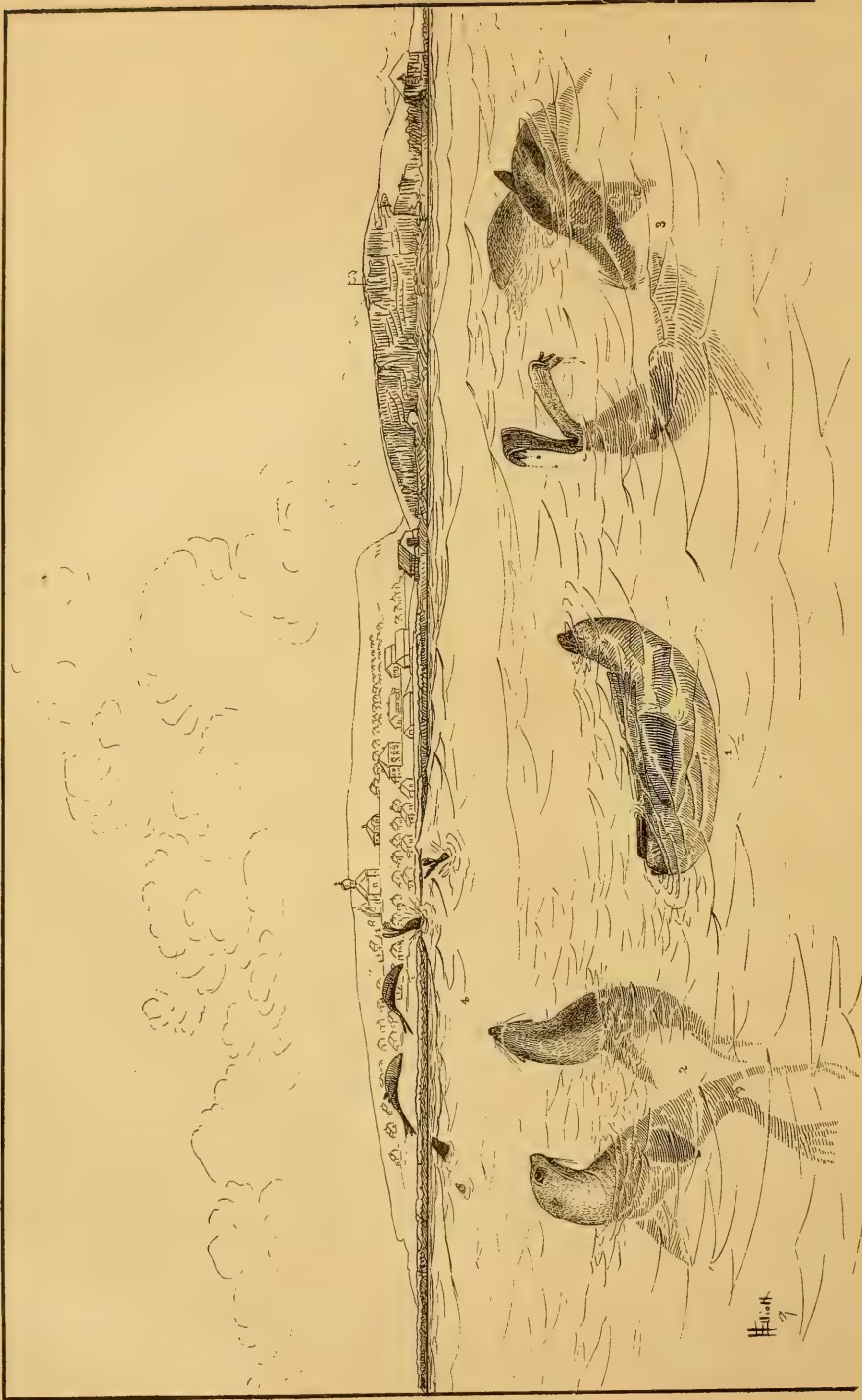
How many pounds per diem is required by an adult seal, and taken by it when feeding, is not certain in my mind. Judging from the appetite, however, of kindred animals, such as sea-lions fed in confinement at Woodward's gardens, San Francisco, I can safely say that forty pounds for a full-grown fur-seal is a fair allowance, with at least ten or twelve pounds per diem to every adult female, and not much less, if any, to the rapidly growing pups and young "holluschickie". Therefore, this great body of four and five millions of hearty, active animals which we know on the seal-islands, must consume an enormous amount of such food every year. They cannot average less than ten pounds of fish each per diem, which gives the consumption, as exhibited by their appetite, of over six million tons of fish every year. What wonder, then, that nature should do something to hold these active fishermen in check.†

* *Anarrhichas* sp.

† I feel confident that I have placed this average of fish eaten per diem by each seal at a starvation allowance, or, in other words, it is a certain minimum of the whole consumption. If the seals can get double the quantity which I credit them with above, startling as it seems, still I firmly believe that they eat it every year. An adequate realization by ichthyologists and fishermen as to what havoc the fur-seal hosts are annually making among the cod, herring, and salmon of the northwest coast and Alaska, would disconcert and astonish them. Happily for the peace of political economists who may turn their attention to the settlement and growth of the Pacific coast of America, it bids fair to never be known with anything like precision. The fishing of man, both aboriginal and civilized, in the past, present, and prospective, has never been, is not, nor will it be, more than a drop in the bucket contrasted with the piscatorial labors of these ichthyophagi in those waters adjacent to their birth. What catholic knowledge of fish and fishing banks any one of those old "seecatchie" must possess, which we observe hauled out on the Pribilof rookeries each summer. It has, undoubtedly, during the eighteen or twenty years of its life, explored every fish eddy, bank, or shoal throughout the whole of that vast immensity of the North Pacific and Bering sea. It has had more piscine sport in a single twelve month than Izaak Walton had in his whole life.

An old sea-captain, Dampier, cruising around the world just about 200 years ago, wrote diligently thereof (or, rather, one Funnell is said to have written for him), and wrote well. He had frequent reference to meeting hair-seals and sea-lions, fur-seals, etc., and fell into repeating this maxim, evidently of his own making: "For wherever there be plenty of fysh, there be seals." I am sure that, unless a vast abundance of good fishing-ground was near by, no such congregation of seal-life as is that under discussion on the seal-islands, could exist. The whole eastern half of Bering sea, in its entirety, is a single fish-spawning bank, nowhere deeper than 50 to 75 fathoms, averaging, perhaps, 40; also, there are great reaches of fishing-shoals up and down the northwest coast, from and above the straits of Fuca, bordering the entire southern, or Pacific, coast of the Aleutian islands. The aggregate of cod, herring, and salmon which the seals find upon these vast ichthyological areas of reproduction, must be simply enormous, and fully equal to the most extravagant demand of the voracious appetites of *Callorhini*.

When, however, the fish retire from spawning here, there, and everywhere over these shallows of Alaska and the northwest coast, along by the end of September to 1st of November, every year, I believe that the young fur-seal, in following them into the depths of the great Pacific, must have a really arduous struggle for existence—unless it knows of fishing banks unknown to us. The yearlings, however, and all above that age, are endowed with sufficient muscular energy to dive rapidly in deep soundings, and to fish with undoubted success. The pup, however, when it goes to sea, five or six months old, is not lithe and sinewy like the yearling; it is podgy and fat, a comparative clumsy swimmer, and does not develop, I believe, into a good fisherman until it has become pretty well starved after leaving the Pribilofs.



PELAGIC ATTITUDES OF THE FUR-SEAL.

1. Position when sleeping.
2. Position in rising to breathe, survey, etc.
3. Positions in scratching, etc.
4. "Dolphin jumps."

The village of St. Paul in the distance, and the Black Bluffs to the right on the middle ground.

PELAGIC RANGE OF FUR-SEALS FOR FOOD.—During the winter solstice—between the lapse of the autumnal, and the verging of the vernal equinoxes—in order to get this enormous food supply, the fur-seals are necessarily obliged to disperse over a very large area of fishing ground, ranging throughout the North Pacific, 5,000 miles across between Japan and the straits of Fuca. In feeding, they are brought to the southward all this time; and, as they go, they come more and more in contact with those natural enemies peculiar to the sea of these southern latitudes, which are almost strangers and are really unknown to the waters of Bering sea; for I did not observe, with the exception of ten or twelve perhaps, certainly no more, killer-whales,* a single marine disturbance, or molestation, during the three seasons which I passed upon the islands, that could be regarded in the slightest degree inimical to the peace and life of the *Pinnipedia*; and thus, from my observation, I am led to believe that it is not until they descend well to the south of the Aleutian islands, and in the North Pacific, that they meet with sharks to any extent, and are diminished by the butchery of killer-whales.†

The young fur-seals going out to sea for the first time, and following in the wake of their elders, are the clumsy members of the family. When they go to sleep on the surface of the water, they rest much sounder than the others; and their alert and wary nature, which is handsomely developed ere they are two seasons old, is in its infancy. Hence, I believe that vast numbers of them are easily captured by marine foes, as they are stupidly sleeping, or awkwardly fishing.

BEHAVIOR OF FUR-SEALS IN THE WATERS AROUND THE ISLANDS.—In this connection I wish to record an impression very strongly made upon my mind, in regard to their diverse behavior when out at sea, away from the islands, and when congregated thereon. As I have plainly exhibited in the foregoing chapter, they are practically without fear of man when he visits them on the land of their birth and recreation; but the same seal that noticed you with quiet indifference at St. Paul, in June and July, and the rest of the season while he was there, or gambolled around your boat when you rowed from the ship to shore, as a dog will play about your horses when you drive from the gate to the house, that same seal, when you meet him in one of the passes of the Aleutian chain, 100 or 200 miles away from here, as the case may be, or to the southward of that archipelago, is the shiest and varriest creature your ingenuity can define. Happy are you in getting but a single glimpse of him, first; you will never see him after, until he hauls out, and winks and blinks across Lukannon sands.‡

But the companionship and the exceeding number of the seals, when assembled together annually, makes them bold; largely due, perhaps, to their fine instinctive understanding, dating, probably, back many years, seeming to know that man, after all, is not wantonly destroying them; and what he takes, he only takes from the ravenous maw of the killer-whale or the saw-tipped teeth of the Japan shark. As they sleep in the water, off the straits of Fuca, and the northwest coast as far as Dixon's sound, the Indians, belonging to that region, surprise them with spears and rifle, capturing quite a number every year, chiefly pups and yearlings.

I must not be understood as saying that fish alone constitute the diet of the Pribilof pinnipeds; I know that they feed, to a limited extent, upon crustaceans and upon the squid (*Loligo*), also, eating tender algoid sprouts; I believe that the pup-seals live for the first five or six months at sea largely, if not wholly, upon crustaceans and squids; they are not agile enough, in my opinion, to fish successfully in any great degree, when they first depart from the rookeries.

* But I did observe a very striking exhibition, however, of this character one afternoon while looking over Lukannon bay. I saw a "killer" chasing the alert "holluschickie" out beyond the breakers, when suddenly, in an instant, the cruel cetacean was turned toward the beach in hot pursuit, and in less time than this is read the ugly brute was high and dry upon the sands. The natives were called, and a great feast was in prospect when I left the carcass.

But this was the only instance of the orca in pursuit of seals that came directly under my observation; hence, though it does undoubtedly capture a few here every year, yet it is an insignificant cause of destruction, on account of its rarity.

† In the stomach of one of these animals, year before last, 14 small harp-seals were found.—*Michael Carroll's Report of Seal and Herring Fisheries of Newfoundland.*

‡ When fur-seals were noticed, by myself, far away from these islands, at sea, I observed that then they were as shy and as wary as the most timorous animal which, in dreading man's proximity, could be—sinking instantly on apprehending the approach or presence of the ship, seldom to reappear to my gaze. But, when gathered in such immense numbers at the Pribilof islands, they are suddenly metamorphosed into creatures wholly indifferent to my person. It must cause a very curious sentiment in the mind of him who comes for the first time, during the summer season, to the island of St. Paul; where, when the landing boat or lighter carries him ashore from the vessel, the whole short marine journey is enlivened by the gambols and aquatic evolutions of fur-seal convoys to the "bidarra," which sport joyously and fearlessly round and round his craft, as she is rowed lustily ahead by the natives; the fur-seals, then, of all classes, "holluschickie" principally, pop their dark heads up out of the sea, rising neck and shoulders erect above the surface, to peer and ogle at him and at his boat, diving quickly to reappear just ahead or right behind, hardly beyond striking distance from the oars; these gymnastics of *Callorhinus* are not wholly performed thus in silence, for it usually snorts and cluckles with hearty reiteration.

The sea-lions up here also manifest much the same marine interest, and gives the voyager an exhibition quite similar to the one which I have just spoken of, when a small boat is rowed in the neighborhood of its shore rookery; it is not, however, so bold, confident, and social as the fur-seal under the circumstances, and utters only a short, stifled growl of surprise, perhaps; its mobility, however, of vocalization is sadly deficient when compared with the scope and compass of its valuable relative's polyglottis.

The hair-seals (*Phoca vitulina*) around these islands never approached our boats in this manner, and I seldom caught more than a furtive glimpse of their short, bull-dog heads when traversing the coast by water.

The walrus (*Rosmarus obesus*) also, like *Phoca vitulina*, gave undoubted evidence of sore alarm over the presence of my boat and crew anywhere near its proximity in similar situations, only showing itself once or twice, perhaps, at a safe distance by elevating nothing but the extreme tip of its muzzle and its bleared, popping eyes above the water; it uttered no sound except a dull, muffled grunt, or else a choking, gurgling bellow.

ENCYSTED BULLETS, ARROWS, ETC., IN FUR-SEALS.—On the killing-grounds at St. George, in June, 1873, the natives would frequently call my attention to seals that they were skinning, in the hides of which buckshot were embedded and encysted just under the skin, in the blubber. From one animal I picked out fifteen shot, and the holes which they must have made in the skin were so entirely healed over as not to leave the faintest trace of a scar. These buckshot were undoubtedly received from the natives of the northwest coast, anywhere between the straits of Fuca and the Aleutian islands. The number taken by these hunters on the high seas is, however, inconsiderable; the annual average, perhaps, of 5,000 skins is a fair figure—some seasons more, some seasons less. The natives also have found on the killing-grounds, in the manner just indicated, specimens of the implements employed by the Aleuts to the southward, such as tips of birds' spears and bone lances, comfortably encysted in the blubber under the skin; but only very small fragments are found, because I believe any larger pieces would create suppuration and slough out of the wounds.*

INCREASE OF THE SEAL-LIFE.—I am free to say that it is not within the power of human management to promote this end to the slightest appreciable degree over its present extent and condition as it stands in the state of nature, heretofore described. It cannot fail to be evident, from my detailed narration of the habits and life of the fur-seal on these islands during so large a part of every year, that could man have the same supervision and control over this animal during the whole season which he has at his command while they visit the land, he might cause them to multiply and increase, as he would so many cattle, to an indefinite number—only limited by time and the means of feeding them. But the case in question, unfortunately, is one where the fur-seal is taken, by demands for food, at least six months out of every year, far beyond the reach or even cognizance of any man, where it is all this time exposed to many known powerful and destructive natural enemies, and probably many others, equally so, unknown, which prey upon it, and, in accordance with that well-recognized law of nature, keeps this seal-life at a certain number—at a figure which has been reached, for ages past, and will continue to be in the future, as far as they now are—their present maximum limit of increase, namely, between four and five million seals, in round numbers. This law holds good everywhere throughout the animal kingdom, regulating and preserving the equilibrium of life in the state of nature; did it not hold good, these seal-islands and all Bering sea would have been literally covered, and have swarmed like the *Meduse* of the waters, long before the Russians discovered them. But, according to the silent testimony of the rookeries, which have been abandoned by the seals, and the noisy, emphatic assurance of those now occupied, there were no more seals when first seen here by human eyes in 1786 and 1787, than there are now in 1881, as far as all evidence goes.

* Touching this matter of the approximate numbers of fur-seals which are annually slain in the open sea, straits, and estuaries of Bering and the North Pacific oceans, I have, necessarily, no definite data upon which to base a calculation; but such as I have, points to the capture every year of 1,000 to 1,400 young fur-seals in the waters of Oomnak pass, and as many in the straits adjoining Borka village, by the resident Aleuts; these are the only two points throughout the entire Aleutian chain and the peninsula where any *Callorhinus* is taken by the natives, except an odd example now and then elsewhere. On the northwest coast, between San Francisco and Prince William sound, the fur-seal is only apprehended, to any extent, at two points, viz, off the straits of Fuca, ten to twenty miles at sea, sweeping over a series of large fishing shoals which are located there, and in that reach of water between Queen Charlotte island and the mouth of Dixon sound. Several small schooners, with native crews, and the Indians, themselves, in their own canoes, cruise for them here during May and June of each year. How many they secure every season is merely a matter of estimation, and therefore not a subject of definite announcement. In my judgment, after carefully investigating the question at Victoria and Port Townsend in 1874, I believe, as an average, that these pelagic fur-sealers do not, altogether, secure 5,000 animals annually.

Those seals killed by the Aleuts of Makushin and Borka settlements, above referred to, are all pups, and are used at home—none exported for trade.

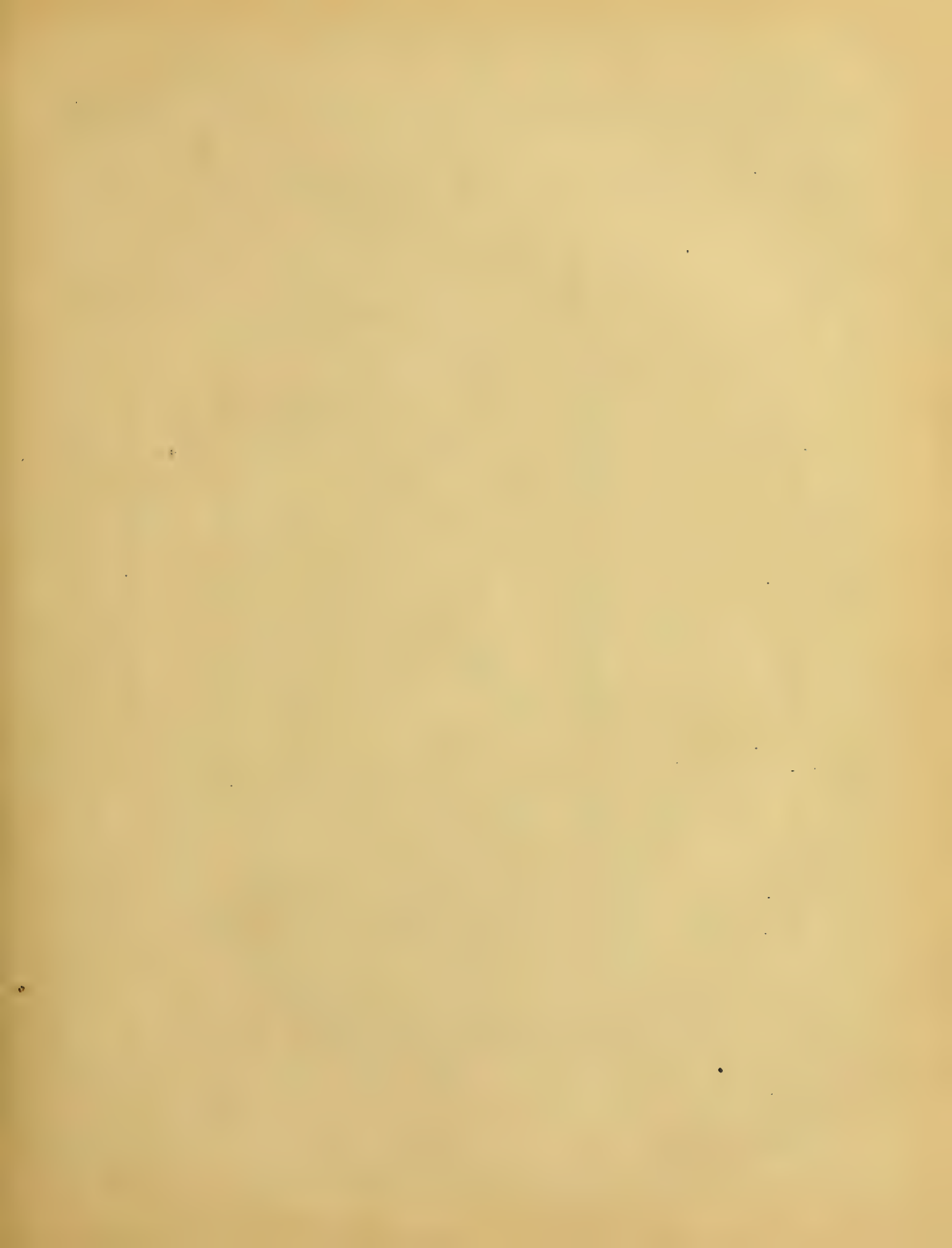
The last record which I can find of fur-seals being taken on land other than that of the Pribylov group of the American side, is the following brief table of Techmainov, who, in 1863, published (in 2 volumes) a long recapitulation of the Russian-American Company's labors in Alaska as illustrated by a voluminous series of personal letters by the several agents of that company. Techmainov says that these fur-seals were taken on the Farralones, which are small islets just abreast of the entrance to the Golden Gate, California.

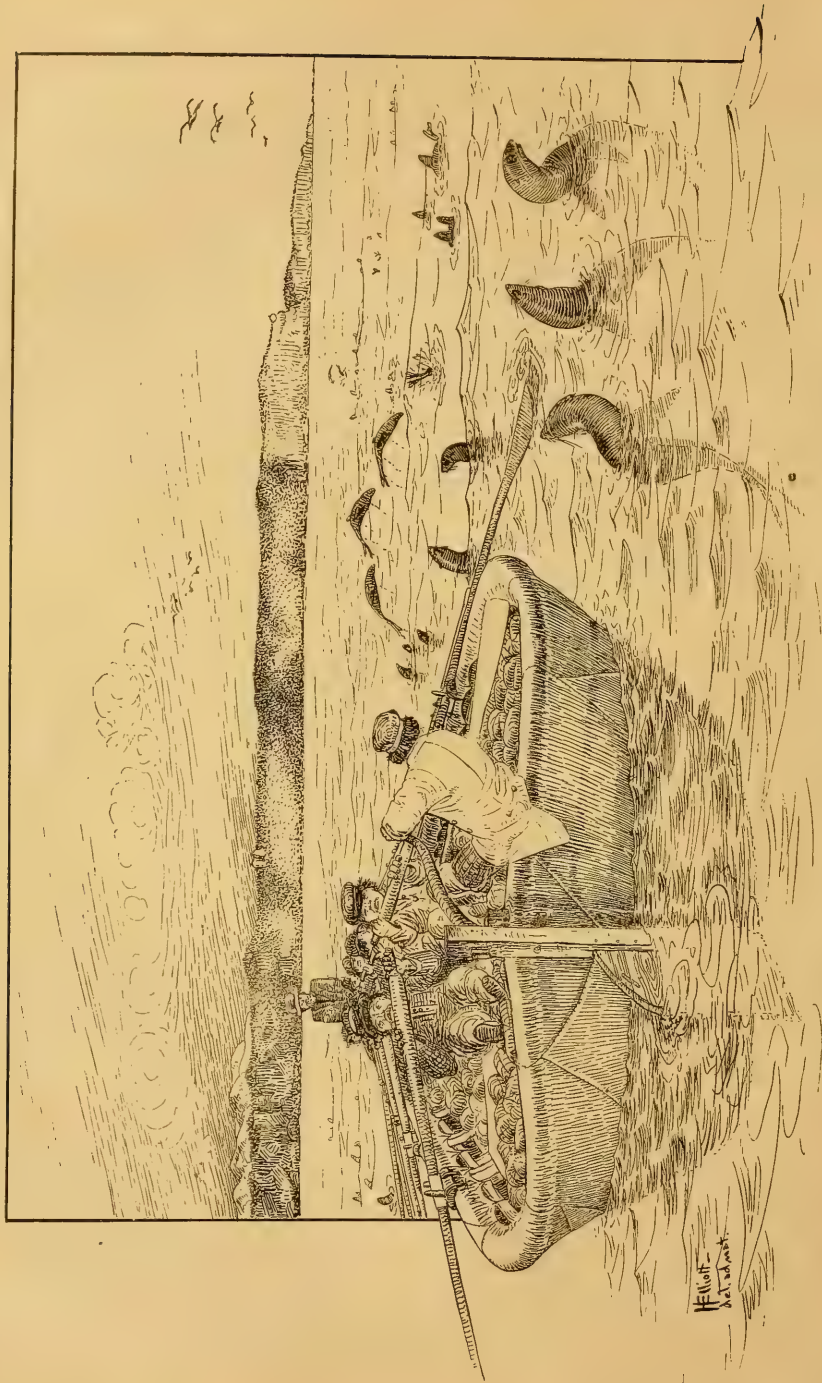
Taken on the Farralones, California coast	1824.	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.
Fur-seals	1,050	455	290	.....	210	287	.....	205	118	54	.....

This period of 1824-1834 was the one passed by the Russians in their occupation of Ross or Bodega, California, where a colony was engaged in raising cereals and beef, for the stations in Alaska. I am inclined to think, however, that very likely many of the specimens of *Callorhinus* counted in this table were shot or speared, as they now are, out at sea off the straits of Fuca. The number is insignificant, but the pelts were not very valuable in those days, and probably very slight exertions were made to get them; or, otherwise, 3,000 or 5,000 annually could have been secured at sea then, as they are to-day, by our people and the Indians of Cape Flattery.

The record, however, of killing fur-seals on the Farralones, between 1806 and 1837, by the Russians, who were established then at Bodega, California, is an honest one. I do not find any mention made of the fact that they bred there, and I am inclined to think they did not. I believe that when small squads of *Callorhinus ursinus* hauled out on the Californian islets, they did so lured by the large numbers of breeding *Zalophus*, and the *Eumetopias* which repaired there then, as they do now, for that purpose. Had the sea-lions not been there, in the manner aforesaid, the presence of fur-seals on North American land, elsewhere than on that of the Pribylov group, would not have been thus determined and established.

Again, in this connection, and corroborative, is the fact that in 1878 a few hundred fur-seals were taken by sea-lion hunters among the *Zalophus* at Santa Barbara and Guadalupe islands, southern Californian coast. I am assured of this fact by the evidence of the gentleman who himself purchased the skins from the lucky hunters. None had ever been seen there before, by our people, and none have been taken since. The Russian archives give no testimony on this score.





FUR-SEALS SPORTING AROUND THE BAIDAR.

Natives of St. Paul lightering off the bundled seal-skins to the ship from the Village Cove.

View looking east over Zoloi Bay on to "Gorbach" of the great Reef Rookery.

SITES OF ABANDONED ROOKERIES.—With reference to the amount of ground covered by the seals, when first discovered by the Russians, I have examined every foot of the shore line of both islands where the bones, and polished rocks, etc., might be lying on any deserted areas. Since then, after carefully surveying the new ground now occupied by the seals, and comparing this area with that which they have deserted, I feel justified in stating that for the last twelve or fifteen years, at least, the fur-seals on these islands have not diminished, nor have they increased as a body to any noteworthy degree; and throughout this time the breeding-grounds have not been disturbed except at that brief but tumultuous interregnum during 1868; and they have been living since in a perfectly quiet and natural condition.

CAN THE NUMBER BE INCREASED?—What can be done to promote their increase? We cannot cause a greater number of females to be born every year than are born now; we do not touch or disturb these females as they grow up and live; and we never will, if the law and present management is continued. We save double—we save more than enough males to serve; nothing more can be done by human agency; it is beyond our power to protect them from their deadly marine enemies as they wander into the boundless ocean searching for food.

In view, therefore, of all these facts, I have no hesitation in saying, quite confidently, that under the present rules and regulations governing the sealing interests on these islands, the increase or diminution of the seal-life thereon will amount to nothing in the future; that the seals will exist, as they do exist, in all time to come at about the same number and condition recorded in this monograph. To test this theory of mine, I here, in the record of my surveys of the rookeries, have put stakes down which will answer, upon those breeding-grounds, as a correct guide as to their present, as well as to their future, condition, from year to year.

SURVEYING THE CONDITION OF THE ROOKERIES.—During the first week of inspection of some of those earliest arrivals, the "seecatchie", which I, have described, will frequently take to the water when approached; but these runaways quickly return. By the end of May, however, the same seals will hardly move to the right or left when you attempt to pass through them. Then, two weeks before the females begin to come in, and quickly after their arrival, the organization of the fur-seal rookery is rendered entirely indifferent to man's presence on visits of quiet inspection, or to anything else, save their own kind, and so continues during the rest of the season.

INDIFFERENCE OF FUR-SEALS TO CARRION SMELLS, BLOOD, ETC.—I have called attention to the singular fact, that the breeding-seals upon the rookeries and hauling grounds are not affected by the smell of blood or carrion arising from the killing-fields, or the stench of blubber fires which burn in the native villages. This trait is conclusively illustrated by the attitude of those two rookeries near the village of St. Paul; for the breeding-ground on this spit, at the head of the lagoon, is not more than forty yards from the great killing-grounds to the eastward; being separated from those spots of slaughter, and the seventy or eighty thousand rotting carcasses thereon, by a slough not more than ten yards wide. These seals can smell the blood and carcasses, upon this field, from the time they land in the spring until they leave in the autumn; while the general southerly winds waft to them the odor and sounds of the village of St. Paul, not over 200 rods south of them, and above them, in plain sight. All this has no effect upon the seals—they know that they are not disturbed—and the rookery, the natives declare, has been slightly but steadily increasing. Therefore, with regard to surveying and taking those boundaries assumed by the breeding-seals every year, at that point of high tide, and greatest expansion, which they assume between the 8th and 15th of July, it is an entirely practicable and simple task. You can go everywhere on the skirts of the rookeries almost within reaching distance, and they will greet you with quiet, inoffensive notice, and permit close, unbroken observation, when it is subdued and undemonstrative, paying very little attention to your approach.

YEARLY CHANGES IN THE ROOKERIES.—I believe the agents of the government there, are going to notice, every year, little changes here and there in the area and distribution of the rookeries; for instance, one of these breeding-grounds will not be quite as large this year as it was last, while another one, opposite, will be found somewhat larger and expanded over the record which it made last season. In 1874, it was my pleasure and my profit to re-traverse all these rookeries of St. George and St. Paul, with my field notes of 1872 in my hand, making careful comparisons of their relative size as recorded then, and now. To show this peculiarity of enlarging a little here, and diminishing a little there, so characteristic of the breeding-grounds, I reproduce the following memoranda of 1874:

NORTHEAST POINT, *July 18, 1874.*

CONTRAST ON ST. PAUL BETWEEN 1872 AND 1874.—Quite a strip of ground near Webster's house has been deserted this season; but a small expansion is observed on Hutchinson's hill. The rest of the ground is as mapped in 1872, with no noteworthy increase in any direction. The condition of the animals and their young, excellent; small irregularities in the massing of the families, due to the heavy rain this morning; sea-lions about the same; none, however, on the west shore of the point.

The aggregate of life on this great rookery is, therefore, about the same as in 1872; the "holluschickie", or killable seals, hauling as well as as numerous as before. The proportions of the different ages among them of two, three, and four-year-olds, pretty well represented.

POLAVINA, *July 18, 1874.*

Stands as it did in 1872; breeding- and hauling-grounds in excellent condition; the latter, on Polavina, are changing from the uplands down upon Polavina sand beach, trending for three miles toward northeast point. The numbers of the "holluschickie" on this ground of Polavina, where they have not been disturbed for some five years, to mention, in the way of taking, do not seem to be any greater than they are on the hauling-grounds adjacent to Northeast point and the village, from which they are driven almost every day

during this season of killing. I notice also this remarkable characteristic of the "holluschickie"; no matter how cleanly the natives may drive the seals off of a given piece of hauling-ground this morning, if the weather is favorable, to-morrow will see it covered again just as thickly; and, thus they drive in this manner from Zoltoi sands almost every day during the killing-season, generally finding on the succeeding morning more, or as many, seals as they drove off the previous dawn. This seems to indicate that the "holluschickie" recognize no particular point as favored over another at the island when they land, which is evidently in obedience to a general desire of coming ashore at such a suitable place as promises no crowding and no fighting.

Not materially changed in any respect from its condition at this time in 1872.

LUKANNON AND KETAVIE, *July 19, 1874.*

Just the same. Condition excellent.

GORBOTCH, *July 19, 1874.*

A slight contraction on the south sea-margin of this ground; compensated for by fresh expansion under the bluffs on the northwest side; not noteworthy in either instance. Condition excellent.

REEF, *July 19, 1874.*

A diminution of one-half at least. Very few here this year. It is no place for a rookery; not a pistol-shot from the natives' houses, and all the natives' children fooling over the bluffs.

NAH SPEEL, *July 20, 1874.*

No noteworthy change; if any, a trifling increase. Condition good. Animals clean and lively.

LAGOON, *July 20, 1874.*

No perceptible change in this rookery from its good shape of 1872. The condition excellent.

TOLSTOI, *July 21, 1874.*

ZAPADNIE, *July 22, 1874.*

A remarkable extension or increase I note here, of 2,000 feet of shore line, with an average depth of 50 feet of breeding-ground, which has been built on to Upper Zapadnie, stretching out toward Tolstoi; the upper rookery proper has not altered its bearings or proportions; the sand beach belt between it and Lower Zapadnie is not occupied by breeding-seals; and a fair track for the "holluschickie", 500 feet wide, left clear, over which they have traveled quite extensively this season, some 20,000 to 25,000 of them, at least, lying out around the old salt-house to-day. Lower Zapadnie has lost in a noteworthy degree about an average of 20 feet of its general depth, which, however, is more than compensated for by the swarming on the upper rookery. A small beginning had been made for a rookery on the shore just southwest from Zapadnie lake, in 1872, but this year it has been substantially abandoned.

CONTRAST ON ST. GEORGE BETWEEN 1873 AND 1874.—An epitomé of my notes for St. George, gives, as to this season of 1874, the following data for comparison with that of 1873:

This rookery shows a slight increase upon the figures of last year, about 5,000. Fine condition.

ZAPADNIE, *July 8, 1874.*

No noteworthy change from last year.

STARRY ATEEL, *July 6, 1874.*

No essential change from last year. Condition very good.

NORTH ROOKERY, *July 6, 1874.*

A slight diminution of some 2,000 or so. Condition excellent.

LITTLE EASTERN, *July 6, 1874.*

EASTERN ROOKERY, *July 7, 1874.*

A small increase over last year of about 3,000, only trifling, however; the aggregate seal-life here similar to that of last season, with the certainty of at least a small increase. The unusually early season, this year, brought the rookery "seecatchie" on the ground very much in advance of the general time; they landed as early as the 10th of April, while the arrival of the cows was as late as usual, corresponding to my observations during the past seasons.

The general condition of the animals of all classes on St. George is most excellent—they are sleek, fat, and free from any disease.

In this way it is plain that, practically, the exact condition of these animals can be noted every season; and, should a diminution be observed, due to any cause, known or unknown, the killing can be promptly regulated, or stopped, to any required quota.

Ten years have passed, with the end of last season, in which nearly 100,000 young males have been annually taken on St. Paul and St. George; 75,000 from the former, and 25,000 from the latter, as a rule; and we now have the experience with which to enlighten our understanding, and to make our statement correct. That affirmation is, that if the effect of annually killing 100,000 young male seals is either to increase or to diminish the seal-life on the Pribylov islands, it cannot be noticed; it has not to a certainty wrought injury, and it has not promoted an increase. I advanced this hypothesis in 1873; and I now find it completely verified and confirmed by the united, intelligent testimony of those who have followed on the ground in my footsteps.

PECUNIARY VALUE OF THE SEAL-LIFE ON THE PRIBYLOV ISLANDS.—The theoretical value of these interests of the government on the Pribylov islands, represented by 2,500,000 to 3,000,000 fur-seals, male and female, in good condition, is not less than \$10,000,000 or \$12,000,000; taking, however, the females out of the question, and from this calculation, and looking at the "holluschickie" alone, as they really represent the only killable seals, then the commercial value of the same would be expressed by the sum of \$1,800,000 to \$2,000,000; this is a permanent principal invested here, which now nets the public treasury more than 15 per cent. annually; a very handsome rate of interest, surely.

STRANGE IGNORANCE OF THEIR VALUE IN 1867.—Considering that this return is the only one made to the government by Alaska, since its transfer, and that it was never taken into account, at first, by the most ardent

advocates of the purchase of Russian-America, it is in itself highly creditable and interesting; to Senator Sumner the friends of the acquisition of this territory in 1867, delegated the task of making the principal argument in its favor. Everything that was written in strange tongues was carefully translated for the choice bits of mention which could be found of Alaska's value. Hence his speech* on the subject possesses this interest: it is the embodiment of everything that could be scraped together, having the faintest shadow of authenticity, by all of the eager friends of the purchase, which gave the least idea of any valuable natural resources in Alaska; therefore, when, in summing all this up, he makes no reference whatever to the seal-islands, or the fur-seal itself, the extraordinary ignorance at home and abroad relative to the Pribylov islands can be well appreciated.

THOUGHTS UPON THE POSSIBLE MOVEMENTS OF THE FUR-SEALS IN THE FUTURE.—As these animals live and breed upon the Pribylov islands, the foregoing studies of their habit declare certain natural conditions of landing-ground and climate to be necessary for their existence and perpetuation. From my surveys made upon the islands to the north, St. Matthew and St. Lawrence, together with the scientific and corroborating testimony of those who have visited all of the mainland coast of Alaska, and the islands contiguous, including the peninsula and the great Aleutian archipelago, I have no hesitation in stating that the fur-seal cannot breed, or rest for that matter, on any other land than that now resorted to, which lies within our boundary lines; the natural obstacles are insuperable. Therefore, so far as our possessions extend, we have, in the Pribylov group, the only eligible land to which the fur-seal can repair for breeding; and on which, at St. Paul island alone, there is still room enough of unoccupied rookery-ground for the accommodation of twice as many seals as we find there to-day. But we must not forget a very important prospect; for, we know that to the westward, only 700 miles, and within the jurisdiction of Russia, are two other seal-islands—one very large, on which the fur-seal regularly breeds also; and though from the meager testimony in my possession, compared with St. Paul, the fur-seal life upon them is small, still, if that land within the pale of the czar's dominion be as suitable for the reception of the rookeries as is that of St. Paul, then what guarantee have we that the seal-life on Copper and Bering islands, at some future time, may not be greatly augmented by a corresponding diminution of our own, with no other than natural causes operating? Certainly, if the ground on either Bering or Copper island, in the Commander group, is as well suited for the wants of the breeding fur-seal as is that exhibited by the Pribylov islands, then I say confidently that we may at any time note a diminution here and find a corresponding augmentation there; for I have clearly shown, in my chapter on the habits of these animals, that they are not so particularly attached to the respective places of their birth, but that they rather land with an instinctive appreciation of the fitness of that ground as a whole.

NEED OF MORE DEFINITE KNOWLEDGE CONCERNING THE RUSSIAN SEAL-ISLANDS.—If we, however, possess all the best suited ground, then we can count upon retaining the seal-life as we now have it, by a vast majority, and, in no other way; for it is not unlikely that some season may occur when an immense number of the fur-seals, which have lived during the last four or five years on the Pribylov islands, should be deflected from their usual feeding-range at sea by the shifting of schools of fish, and other abnormal causes, which would bring them around quite close to the Asiatic seal-grounds, in the spring; and the scent from those rookeries would act as a powerful stimulant and attraction for them to land there, where the conditions for their breeding may be just as favorable as they desire. Such being the case, this diminution, therefore, which we would notice on the Pribylov group, might be the great increase observed at the Commander islands, and not due to any mismanagement on the part of the men in charge of these interests. Thus, it appears to me necessary that definite knowledge concerning the Commander islands and the Kuriles should be gathered.

If we find, however, that the character of this Russian seal land is restricted to narrow beach-margins, under bluffs, as at St. George, then we shall know that a great body of seals will never attempt to land there when they could not do so without suffering, and in violation of their laws, during the breeding-season. Therefore, with this correct understanding to start on, we can then feel alarmed with good reason, should we ever observe any diminution, to a noteworthy degree, on our seal-islands of Bering sea.

POSSIBLE DEFLECTION OF SEALS IN FEEDING.—I do not call attention to this subject with the slightest idea in my mind, as I write, of any such contingency arising, even for an indefinite time to come; but still I am sensible of the fact that it is possible for it to occur any season. But the seals undoubtedly feed on their pelagic fields in systematic routine of travel, from the time they leave the Pribylov islands until that of their return; therefore, in all probability, unless the fish upon which they are nourished suddenly become scarce in our waters and soundings, the seals will not change their base, as matters now progress; but it is possible for the finny shoals and schools to be so deflected from their migration to and from their spawning-beds, as to carry this seal-life with it, as I have hinted above. Thus it cannot be superfluous to call up this question, so that it shall be prominent in discussion, and suggestion for future thought.

NEED OF CAREFUL YEARLY EXAMINATION.—In the meantime the movements of the seals upon the great breeding-rookeries of St. Paul and those of St. George should be faithfully noted and recorded every year; and as time goes on this record will place the topic of their increase or diminution beyond all theory or cavil.

* Speech on cession of Russian-America, U. S. Senate, 1867; "Summary," p. 43.

12. MANNER OF TAKING THE SEALS.

EXHIBIT OF ALL SKINS SHIPPED FROM THE PRIBYLOV ISLANDS.—As an exhibit of the entire number of fur-seal skins taken for taxes and sale from the Pribylov islands, between 1797 and 1880, inclusive, I present the following table, which, although it may vary from the true aggregate, during the long period of nearly one hundred years covered by it, I am nevertheless satisfied it is the best evidence of the kind which can be obtained. Prior to the year 1868 it will be noticed that I have given only a series of estimates for the period antedating that year, as far back as 1862. The reason for this is that I can find nowhere, in writing, an authenticated record of the catch. It was the policy of the old Russian company invariably to take more skins, every year, from these islands down to Sitka than they could profitably dispose of annually in the markets of the world; a large surplus being yearly left over, which were suffered to decay or be destroyed by moths, and subsequently thrown into the sea. I can only judge, therefore, of what they took in that period, from what I know they had on hand in their salt-house at St. George and St. Paul during 1867, which was 40,000 to 48,000 skins; and this the natives told me was a larger average than they had taken for a great many years prior to that date. Hence, I have proportioned it back to the last record, which I find in Techmainov, whose figures, embraced in the three periods, from 1796 to 1861, have been given as copied by him from the authentic archives of the old Russian company; he is careful to say, in this connection, that the exhibit does not show all skins that were taken from the seal-islands, but only those which the Russians took for sale from Sitka.

And, again, other Russian authors, rather than this historian of the Russian American Company, have said that immense numbers of fur-seal skins—hundreds of thousands—were frequently accumulated in the warehouses at Sitka only to decay and be destroyed. Their aggregate cannot be estimated within any bound of accuracy, and it is not in the sum total of the following table. What we have taken on the island, since 1868, is presented below, almost correct. In the appendix, where I give a short digest of Professor Nordenskiöld's visit to Bering island, will be found another table showing the number of skins taken from those Russian Commander islands. In the following table, relative to the Pribylov group, it will be noticed that there is a gap of ten years, between 1786, the date of their discovery, and 1805, the time of the earliest Russian record. How many were taken then, there is not the faintest evidence in black and white; but we do know that from the time of the discovery of the Pribylov islands up to 1799, the taking of fur-seals on both of these islands progressed without count or lists, and without any responsible head or director; because there were then, upon those islands, seven or eight different companies, represented by as many agents or leaders, and all of them vied one with the other in taking as many fur-seals as they could:*

Fur-seal skins taken from the Pribylov islands for shipment and sale.

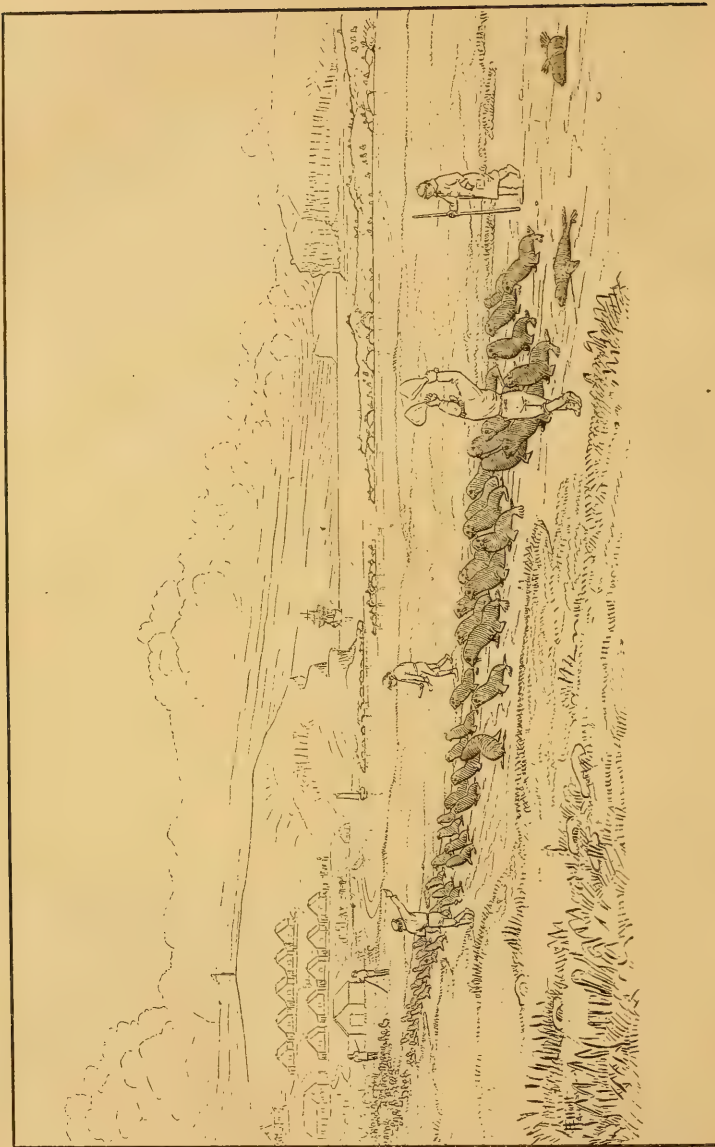
Period.	Number of skins.	Period.	Number of skins.	Period.	Number of skins.	Period.	Number of skins.
* 1797-1821 (24 years).....	1,232,374	1864.....	126,000	1870.....	9,965	1876.....	99,000
* 1821-1842 (21 years).....	458,502	1865.....	140,000	1871.....	63,000	1877.....	83,500
* 1842-1861 (19 years).....	372,000	1866.....	142,000	1872.....	99,000	1878.....	55,000
1862.....	120,000	1867.....	148,000	1873.....	99,630	1879.....	99,968
1863.....	125,000	1868.....	242,000	1874.....	99,820	1880.....	99,950
		1869.....	87,000	1875.....	99,500	Total, 1797 to 1880 ..	3,561,651

* Including about 5,000 annually from the Commander islands.

THE MANNER IN WHICH THE SEALS ARE TAKEN.—By reference to the habit of the fur-seal, which I have discussed at length, it is now plain and beyond doubt, that two-thirds of all the males which are born, and they are equal in numbers to the females born, are never permitted by the remaining third, strongest by natural selection, to land upon the same breeding-ground with the females, which always herd thereupon *en masse*. Hence, this great band of "bachelor" seals, or "holluschickie", so fitly termed, when it visits the island is obliged to live apart entirely—sometimes, and some places, miles away from the rookeries; and, in this admirably perfect method of nature are those seals which can be properly killed without injury to the rookeries, selected and held aside by their own volition, so that the natives can visit and take them without disturbing, in the least degree, the entire quiet of the breeding-grounds, where the stock is perpetuated.

The manner in which the natives capture and drive the "holluschickie" up from the hauling-grounds to the slaughter-fields near the two villages of St. Paul and St. George, and elsewhere on the islands, cannot be improved

* The attempt, on my part, to get an authentic list of the numbers of fur-seals slain upon the Pribylov islands, prior to 1868, has simply been, to my mind, a partial failure. My investigation and search for such record, has satisfied me that it does not exist; memoranda of shipments only, each season, were made by the agents of the Russian company when the vessels took those skins from the seal-islands to Sitka; and of these skins again, count was only made of such as were exported to China or Russia, no mention being made anywhere of the number which was consumed in Alaska by the company's large force of attachés, or else destroyed at New Archangel. This method of accounting for the yield from the Pribylovs from 1806 or 1817 up to 1867, naturally confuses a correct determination as to the sum total—renders it, perhaps, very inaccurate. This explanation is, at least, due to the reader.



NATIVES DRIVING THE "HOLLUSCHICKIE."

The drove passing over the lagoon flats to the killing-grounds, under the village hill, St. Paul Island.

Looking S. S. W. over the village cove and Lagoon Breeding Rookery, July 14, 1872.

upon. It is in this way: at the beginning of every sealing-season, that is, during May and June, large bodies of the young "bachelor" seals do not haul up on land very far from the water—a few rods at the most—and, when these first arrivals are sought after, the natives, in capturing them, are obliged to approach slyly and run quickly between the dozing seals and the surf, before they can take alarm and bolt into the sea; in this manner a dozen Aleuts, running down the sand beach of English bay, in the early morning of some June day, will turn back from the water thousands of seals, just as the mold-board of a plow lays over and back a furrow of earth. When the sleeping seals are first startled, they arise, and, seeing men between them and the water, immediately turn, lope, and scramble rapidly back up and over the land; the natives then leisurely walk on the flanks and in the rear of the drove thus secured, directing and driving it over to the killing-grounds, close by the village.*

PROGRESSION OF A SEAL-DRIVE.—A drove of seals on hard or firm grassy ground, in cool and moist weather, may be driven with safety at the rate of half a mile an hour; they can be urged along, with the expenditure of a great many lives, however, at the speed of a mile or a mile and a quarter per hour; but this is seldom done. An old bull seal, fat and unwieldy, cannot travel with the younger ones, though it can lope or gallop as it starts across the ground as fast as an ordinary man can run, over 100 yards; but then it fails utterly, falls to the earth supine, entirely exhausted, hot, and gasping for breath.

The "holluschickie" are urged along over the path leading to the killing-grounds with very little trouble, and require only three or four men to guide and secure as many thousand at a time. They are permitted frequently to halt and cool off, as heating them injures their fur. These seal-halts on the road always impressed me with a species of sentimentalism and regard for the creatures themselves. The men dropping back for a few moments, the awkward shambling and scuffling of the march at once ceases, and the seals stop in their tracks to fan themselves with their hind-flippers, while their heaving flanks give rise to subdued panting sounds. As soon as they apparently cease to gasp for want of breath, and are cooled off comparatively, the natives step up once more, clatter a few bones with a shout along the line, and the seal-shamble begins again—their march to death and the markets of the world is taken up anew.

DOCILITY OF FUR-SEALS WHEN DRIVEN.—I was also impressed by the singular docility and amiability of these animals when driven along the road; they never show fight any more than a flock of sheep would do; if, however, a few old seals get mixed in, they usually get so weary that they prefer to come to a stand-still and fight rather than move; otherwise no sign whatever of resistance is made by the drove from the moment it is intercepted, and turned up from the hauling-grounds, to the time of its destruction at the hands of the sealing-gang.

This disposition of the old seals to fight rather than endure the panting torture of travel, is of great advantage to all parties concerned; for they are worthless commercially, and the natives are only too glad to let them drop behind, where they remain unmolested, eventually returning to the sea. The fur on them is of little or no value; their under wool being very much shorter, coarser, and more scant than in the younger; especially so on the posterior parts along the median line of the back.

CHANGE IN PELAGE.—This change for the worse or deterioration of the pelage of the fur-seal takes place, as a rule, in the fifth year of their age; it is thickest and finest in texture during the third and fourth year of life; hence, in driving the seals on St. Paul and St. George up from the hauling-grounds the natives make, as far as practicable, a selection from males of that age.

* The task of getting up early in the morning, and going out to the several hauling-grounds, closely adjacent, is really all there is of the labor involved in securing the number of seals required for the day's work on the killing-grounds. The two, three, or four natives upon whom, in rotation, this duty is devolved by the order of their chief, rise at first glimpse of dawn, between 1 and 2 o'clock, and hasten over to Lukannon, Tolstoi, or Zoltoi, as the case may be, "walk out" their "holluschickie", and have them duly on the slaughtering-field before 6 or 7 o'clock, as a rule, in the morning. In favorable weather the "drive" from Tolstoi consumes two and a half to three hours' time; from Lukannon, about two hours, and is often done in an hour and a half; while Zoltoi is so near by that the time is merely nominal.

I heard a great deal of talk among the white residents of St. Paul, when I first landed and the sealing-season opened, about the necessity of "resting" the hauling-grounds; in other words, they said that if the seals were driven in repeated daily rotation from any one of the hauling-grounds, that this would so disturb these animals as to prevent their coming to any extent again thereon, during the rest of the season. This theory seemed rational enough to me at the beginning of my investigations, and I was not disposed to question its accuracy; but, subsequent observation directed to this point particularly, satisfied me, and the sealers themselves with whom I was associated, that the driving of the seals had no effect whatever upon the hauling which took place soon or immediately after the field, for the hour, had been swept clean of seals by the drivers. If the weather was favorable for landing, i. e., cool, moist, and foggy, the fresh hauling of the "holluschickie" would cover the bare grounds again in a very short space of time—sometimes in a few hours after the driving of every seal from Zoltoi sands over to the killing-fields adjacent, those dunes and the beach in question would be swarming anew with fresh arrivals. If, however, the weather is abnormally warm and sunny, during its prevalence, even if for several consecutive days, no seals to speak of will haul out on the emptied space; indeed, if these "holluschickie" had not been taken away by man from Zoltoi or any other hauling-ground on the islands when "tayopli" weather prevailed, most of those seals would have vacated their terrestrial loafing places for the cooler embraces of the sea.

The importance of clearly understanding this fact as to the readiness of the "holluschickie" to haul promptly out on steadily "swept" ground, provided the weather is inviting, is very great; because, when not understood, it was deemed necessary, even as late as the season of 1872, to "rest" the hauling-grounds near the village (from which all the driving has been made since), and make trips to far away Polavina and distant Zapadnić—an unnecessary expenditure of human time, and a causeless infliction of physical misery upon phocine backs and flippers.

It is quite impossible, however, to get them all of one age without an extraordinary amount of stir and bustle, which the Aleuts do not like to precipitate; hence the drive will be found to consist usually of a bare majority of three and four-year-olds, the rest being two-year-olds principally, and a very few, at wide intervals, five-year-olds, the yearlings seldom ever getting mixed up.

METHOD OF LAND TRAVEL.—As the drove progresses along the path to the slaughtering grounds, the seals all move in about the same way; they go ahead with a kind of walking step and a sliding, shambling gallop. The progression of the whole caravan is a succession of starts, spasmodic and irregular, made every few minutes, the seals pausing to catch their breath, and make, as it were, a plaintive survey and mute protest. Every now and then a seal will get weak in the lumbar region, then drag its posteriors along for a short distance, finally drop breathless and exhausted, quivering and panting, not to revive for hours—days, perhaps—and often never. During the driest driving-days, or those days when the temperature does not combine with wet fog to keep the path moist and cool, quite a large number of the weakest animals in the drove will be thus laid out and left on the track. If one of these prostrate seals is not too much heated at the time, the native driver usually taps the beast over the head and removes its skin.*

PROSTRATION OF FUR-SEALS BY HEAT.—This prostration from exertion will always happen, no matter how carefully they are driven; and in the longer drives, such as two and a half, and five miles from Zapadnie on the west, or Polavina on the north, to the village at St. Paul, as much as three or four per cent. of the whole drive will be thus dropped on the road; hence I feel satisfied, from my observation and close attention to this feature, that a considerable number of those that are thus rejected from the drove, and are able to rally and return to the water, die subsequently from internal injuries sustained on the trip, superinduced by this over-exertion. I, therefore, think it highly improper and impolitic to extend drives of the “holluschickie” over any distance on St. Paul island exceeding a mile, or a mile and a half; it is better for all parties concerned, and the business too, that salt-houses be erected, and killing-grounds established contiguous and to all of the great hauling-grounds, two miles distant from the village on St. Paul island, should the business ever be developed above the present limit; or should the exigencies of the future require a quota from all these places, in order to make up the 100,000 which may be lawfully taken.

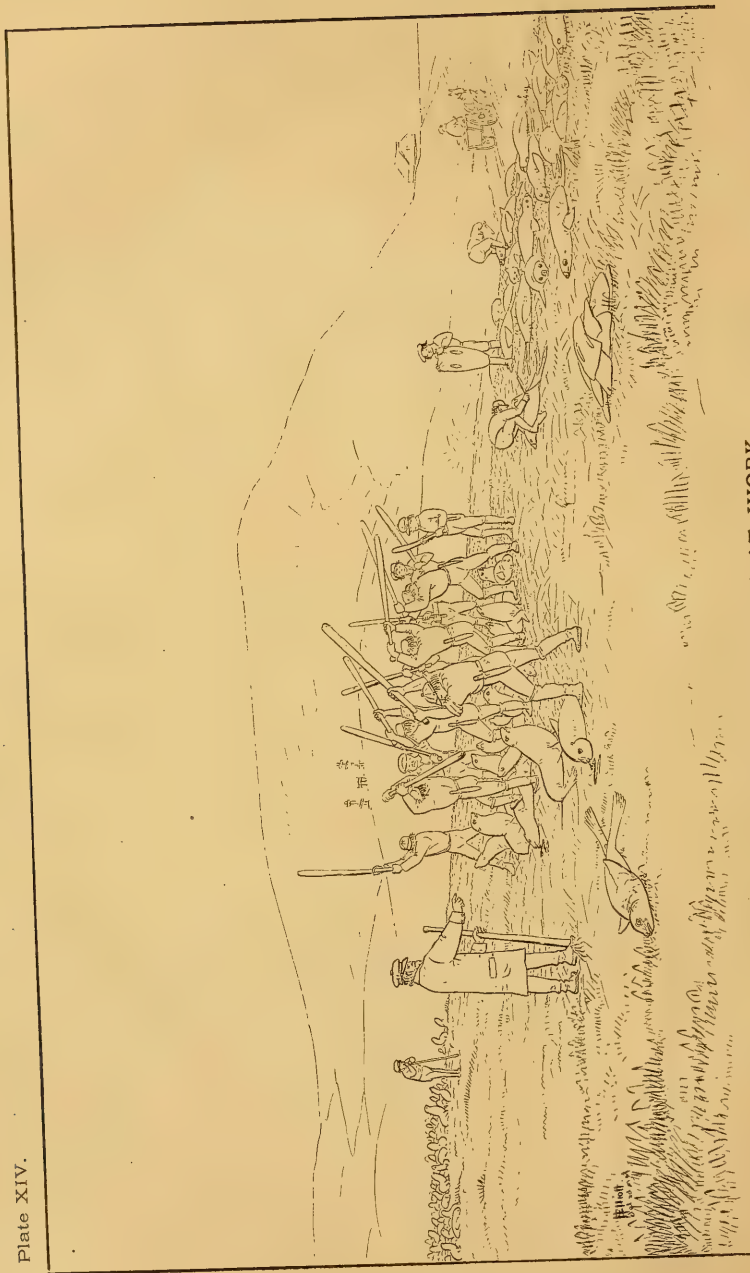
ABUNDANT SUPPLY OF “HOLLUSCHICKIE.”—As matters are to-day, 100,000 seals alone on St. Paul can be taken and skinned in less than forty working days, within a radius of one mile and a half from the village, and from the salt-house at Northeast point; hence the driving, with the exception of two experimental droves which I witnessed in 1872, has never been made from longer distances than Tolstoi to the eastward, Lukannon to the northward, and Zoltoi to the southward of the killing-grounds at St. Paul village. Should, however, an abnormal season recur, in which the larger proportion of days during the right period for taking the skins be warmish and dry, it might be necessary, in order to get even 75,000 seals within the twenty-eight or thirty days of their prime condition, for drives to be made from the other great hauling-grounds to the westward and northward, which are now, and have been for the last ten years, entirely unnoticed by the sealers.

KILLING THE SEALS.—The seals, when finally driven up on those flats between the east landing and the village, and almost under the windows of the dwellings, are herded there until cool and rested. The drives are usually made very early in the morning, at the first breaking of day, which is half-past one to two o'clock of June and July in these latitudes. They arrive, and cool off on the slaughtering-grounds, so that by six or seven o'clock, after breakfast, the able-bodied male population turn out from the village and go down to engage in the work of slaughter. The men are dressed in their ordinary working-garb of thick flannel shirts, stout cassimere or canvas pants, over which the “tarbossa” boots are drawn; if it rains they wear their “kamlaikas”, made of the intestines and throats of the sea-lion and fur-seal. Thus dressed, they are each armed with a club, a stout oaken or hickory bludgeon, which have been made particularly for the purpose at New London, Connecticut, and imported here for this especial service. These sealing clubs are about five or six feet in length, three inches in diameter at their heads, and the thickness of a man's forearm where they are grasped by the hands. Each native also has his stabbing-knife, his skinning-knife, and his whetstone; these are laid upon the grass convenient, when the work of braining or knocking the seals down is in progress. This is all the apparatus which they have for killing and skinning.

THE KILLING GANG AT WORK.—When the men gather for work they are under the control of their chosen foremen or chiefs; usually on St. Paul, divided into two working parties at the village, and a sub-party at Northeast point, where another salt-house and slaughtering-field is established. At the signal of the chief the work of the day begins by the men stepping into the drove, corralled on the flats; and, driving out from it 100 or

* The fur-seal, like all of the pinnipeds, has no sweat-glands; hence, when it is heated, it cools off by the same process of panting which is so characteristic of the dog, accompanied by the fanning that I have hitherto fully described; the heavy breathing and low grunting of a tired drove of seals, on a warmer day than usual, can be heard several hundred yards away. It is surprising how quickly the hair and fur will come out of the skin of a blood-heated seal—literally rubs bodily off at a touch of the finger. A fine specimen of a three-year-old “holluschak” fell in its tracks at the head of the lagoon while being driven to the village killing-grounds. I asked that it be skinned with special reference to mounting; accordingly a native was sent for, who was on the spot, knife in hand, within less than 30 minutes from the moment that this seal fell in the road; yet, soon after he had got fairly to work, patches of the fur and hair came off here and there wherever he chanced to clutch the skin.

Plate XIV.



THE KILLING-GANG AT WORK.

Method of slaughtering Fur-seals on the grounds, near the village, St. Paul Island.
 Natives skinning.

Sealers knocking down a "pod."

The dove in waiting.

150 seals at a time, make what they call a "pod", which they surround in a circle, huddling the seals one on another as they narrow it down, until they are directly within reach and under their clubs. Then the chief, after he has cast his experienced eye over the struggling, writhing "kautickie" in the center, passes the word that such and such a seal is bitten, that such and such a seal is too young, that such and such a seal is too old; the attention of his men being called to these points, he gives the word "strike", and instantly the heavy clubs come down all around, and every one that is eligible is stretched out stunned and motionless, in less time, really, than I take to tell it. Those seals spared by order of the chief, now struggle from under and over the bodies of their insensible companions and pass, hustled off by the natives, back to the sea.*

METHOD OF ALEUTS IN SKINNING FUR-SEALS.—The clubs are dropped, the men seize the prostrate seals by the hind-flippers, and drag them out, so they are spread on the ground without touching each other; then every sealer takes his knife and drives it into the heart at a point between the fore-flippers of each stunned form; the blood gushes forth, and the quivering of the animal presently ceases. A single stroke of a heavy oak bludgeon, well and fairly delivered, will crush in at once the slight, thin bones of a fur-seal's skull, and lay the creature out almost lifeless. These blows are, however, usually repeated two or three times with each animal, but they are very quickly done. The bleeding, which is immediately effected, is so speedily undertaken in order that the strange reaction, which the sealers call "heating", shall be delayed for half an hour or so, or until the seals can all be drawn out, and laid in some disposition for skinning.

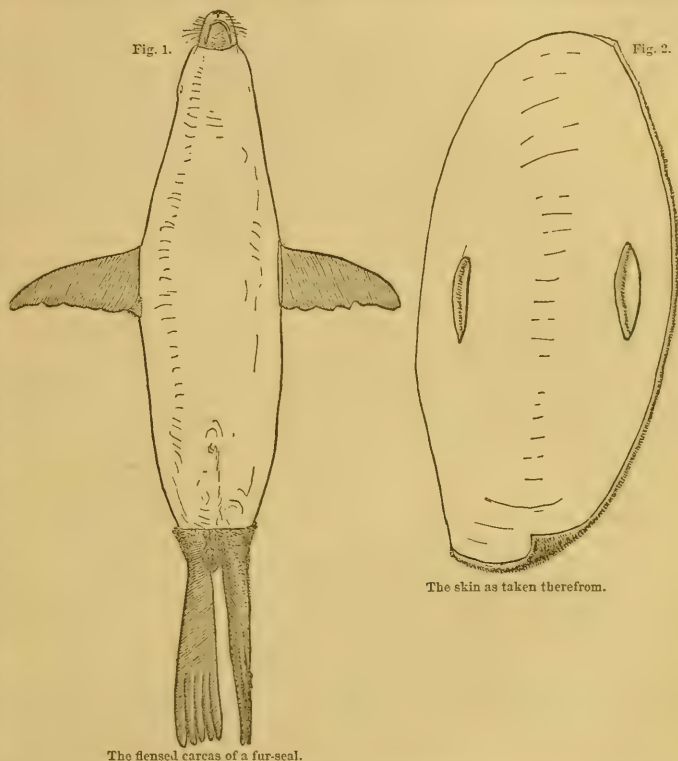
I have noticed that within less than thirty minutes from the time a perfectly sound seal was knocked down, it had so "heated", owing to the day being warmer and drier than usual, that, when touching it with my foot, great patches of hair and fur sealed off. This is a rather exceptionally rapid metamorphosis—it will, however, take place in every instance, within an hour, or an hour and a half

on these warm days, after the first blow is struck, and the seal is quiet in death; hence no time is lost by the prudent chief in directing the removal of the skins as rapidly as the seals are knocked down and dragged out. If it is a cool day, after bleeding the first "pod" which has been prostrated in the manner described, and after carefully drawing the slain from the heap in which they have fallen, so that the bodies will spread over the ground just free from touching one another, they turn to and strike down another "pod"; and so on, until a whole thousand or two are laid out, or the drove, as corraled, is finished. The day, however, must be raw and cold for this wholesale method. Then, after killing, they turn to work, and skin; but, if it is a warm day, every pod is skinned as soon as it is knocked down.

The labor of skinning is exceedingly severe; and is trying even to an expert, demanding long practice ere the muscles of the back and thighs are so developed as to permit a man to bend down to, and finish well, a fair day's

* The aim and force with which the native directs his blow, determines the death of the seal; if struck direct and violently, a single stroke is enough; the seals' heads are stricken so hard sometimes that those crystalline lenses to their eyes fly out from the orbital sockets like hail-stones, or little pebbles, and frequently struck me sharply in the face, or elsewhere, while I stood near by watching the killing-gang at work.

A singular lurid green light suddenly suffuses the eye of the fur-seal at intervals when it is very much excited, as the "podding" for the clubbers is in progress; and, at the moment when last raising its head it sees the uplifted bludgeons on every hand above, fear seems then for the first time to possess it and to instantly gild its eye in this strange manner. When the seal is brained in this state of optical coloration, I have noticed that the opalescent tinting remained well defined for many hours or a whole day after death; these remarkable flashes are very characteristic to the eyes of the old males during their hurly-burly on the rookeries, but never appear in the younger classes unless as just described, as far as I could observe.



The flensed carcass of a fur-seal.

work. The knives used by the natives for skinning are ordinary kitchen or case-handle butcher-knives. They are sharpened to cutting edges as keen as razors; but, something about the skins of the seal, perhaps fine comminuted sand along the abdomen, so dulls these knives, as the natives work, that they are constantly obliged to whet them.

The body of the seal, preparatory to skinning, is rolled over and balanced squarely on its back; then the native makes a single swift cut through the skin down along the neck, chest, and belly, from the lower jaw to the root of the tail, using, for this purpose, his long stabbing knife.* The fore- and hind-flippers are then successively lifted, as the man straddles the seal and stoops down to his work over it, and a sweeping circular incision is made through the skin on them just at the point where the body-fur ends; then, seizing a flap of the hide on either one side or the other of the abdomen, the man proceeds with his smaller, shorter butcher-knife, rapidly to cut the skin, clean and free from the body and blubber, which he rolls over and out from the hide by hauling up on it as he advances with his work, standing all this time stooped over the carcass so that his hands are but slightly above it, or the ground. This operation of skinning a fair-sized "holluschak" takes the best men only one minute and a half; but the average time made by the gang on the ground is about four minutes to the seal. Nothing is left of the skin upon the carcass, save a small patch of each upper lip on which the coarse mustache grows, the skin on the tip of the lower jaw, the insignificant tail,† together with the bare hide of the flippers.

BLUBBER OF FUR-SEAL: UNPLEASANT ODOR.—On the removal of the skin from the body of the fur seal, the entire surface of the carcass is covered with a more or less dense layer, or envelope, of a soft, oily, fat blubber, which in turn completely conceals the muscles or flesh of the trunk and neck; this fatty substance, which we now see, resembles that met with in the seals generally everywhere, only possessing that strange peculiarity not shared by any other of its kind, of being positively overbearing and offensive in odor to the unaccustomed human nostril. The rotting, sloughing carcasses around about did not, when stirred up, affect me more unpleasantly than did this strong, sickening smell of the fur-seal blubber. It has a character and appearance intermediate between those belonging to the adipose tissue found on the bodies of cetacea and some carnivora.

This continuous envelope, of blubber, to the bodies of the "holluschickie" is thickest in deposit at those points upon the breast between the fore-flippers, reaching entirely around and over the shoulders, where it is from one inch to a little over in depth. Upon the outer side of the chest it is not half an inch in thickness, frequently not more than a quarter; and it thins out considerably as it reaches the median line of the back. The neck and head are clad by an unbroken continuation of the same material, which varies from one-half to one-quarter of an inch in depth. Toward the middle line of the abdominal region there is a layer of relative greater thickness. This is coextensive with the sterno-pectoral mass; but it does not begin to retain its volume as it extends backward, where this fatty investment of the carcass upon the loins, buttocks, and hinder limbs fades out finer than on the pectoro-abdominal parts, and assumes a thickening corresponding to the depth on the cervical and dorsal regions. As it

*When turning the stunned and senseless carcasses, the only physical danger of which the sealers run the slightest risk, during the whole circuit of their work, occurs thus: at this moment the prone and quivering body of the "holluschak" is not wholly inert, perhaps, though it is nine times out of ten; and, as the native takes hold of a fore-flipper to jerk the carcass over on to its back, the half-brained seal rouses, snaps suddenly and viciously, often biting the hands or legs of the unwary skinner, who then comes leisurely and unconcernedly up into the surgeon's office at the village, for bandages, etc.; a few men are bitten every day or two during the season on the islands, in this manner, but I have never learned of any serious result following any case.

The sealers, as might be expected, become exceedingly expert in keeping their knives sharp, putting edges on them as keen as razors, and in an instant detect any dullness, by passing the balls of their thumbs over the suspected edges to the blades.

The white sealers of the Antarctic always used the orthodox butchers' "steel" in sharpening their knives, but these natives never have; and, probably never will abandon those little whet-stones above referred to.

During the Russian management, and throughout the strife in killing by our own people in 1868, a very large number of the skins were cut through, here and there, by the slipping of the natives' knives, when they were taking them from the carcasses, and "flensing" them from the superabundance, in spots, of blubber. These knife-cuts through the skin, no matter how slight, give great annoyance to the dresser; hence they are always marked down in price. The prompt scrutiny of each skin on the islands, by the agent of the Alaska Commercial company, who rejects every one of them thus injured, has caused the natives to exercise greater care, and the number now so damaged, every season, is absolutely trifling.

Another source of small loss is due to a habit which the "holluschickie" have of occasionally biting one another when they are being urged along in the drives, and thus crowded once in a while one upon the other; usually these examples of "zoobäiden" are detected by the natives prior to the "knocking down", and spared; yet those which have been nipped on the chest or abdomen cannot be thus noticed; and, until the skin is lifted, the damage is not apprehended.

† This tail of the fur-seal is just a suggestion of the article, and that is all. Unlike the abbreviated caudal extremities of the bear or the rabbit, it does not seem to be under the slightest control of its owner—at least I never could see it move to any appreciable degree, when the seal is in action on land. Certainly there is no service required of it, but it does appear to me rather singular that none of the changeful moods of *Callorhinus* are capable of giving rise to even a tremor in its short stump of a tail. It is never raised or depressed, and, in fact, amounts to a mere excrescence, which many casual observers would not notice. The shrinking, twitching movements of the seal's skin, here and there at irregular intervals, are especially noticed when that animal is asleep, so that even when awake I believe that the dermatological motion is an involuntary one. The tail of the sea-lion is equally inconsequential; that of the walrus, even more so, while *Phoca vitulina* has one a trifle longer, relatively, and much stouter—flesher than that of the fur-seal.

I found that the natives here were pronounced evolutionists, as are all the many Indian tribes, with which I have been thrown in contact during my travels from Mexico to the head of the Stickeen river. They declare that their remote ancestry undoubtedly were fur-seals; indeed, there is a better showing for the brain cases of the fur-seal over that of the monkey's skull as to weight with reference to physical bulk; while their tails are as short or even shorter than most of the anthropoid apes.

descends on the limbs this blubber thins out very perceptibly; and, when reaching the flippers it almost entirely disappears, giving way to a glistening aureolar tissue, while the flipper skin finally descends in turn to adhere closely and firmly to the tendinous ligamentary structures beneath, which constitute the tips of the *Pinnipedia*.

The flesh and the muscles are not lined between, or within, by fat of any kind. This blubber envelope contains it all with one exception—that which is found in the folds of the small intestine and about the kidneys, where there is an abundant secretion of a harder, whiter, though still offensive, fat.

FLESH OF FUR-SEAL AS AN ARTICLE OF DIET.—It is quite natural for our people, when they first eat a meal on the Pribylov islands, to ask questions in regard to what seal meat looks and tastes like; some of the white residents will answer, saying that they are very fond of it, cooked so and so; others will reply that in no shape or manner can they stomach the dish. The inquirers must needs try the effect on their own palates. I frankly confess that I had a slight prejudice against seal meat at first, having preconceived ideas that it would be fishy in flavor, but I soon satisfied myself to the contrary, and found that the flesh of young seals, not over three years old, was full as appetizing and toothsome as most of the beef, mutton, and pork, I was accustomed to at home; the following precautions must be rigidly observed, however, by the cook who prepares fur-seal steaks and sausage balls for our delectation and subsistence—he will fail, if he does not:

1st. The meat must be perfectly cleaned of every vestige of blubber or fat, no matter how slight.

2d. Cut the flesh, then, into very thin steaks or slices, and soak them from six to twelve hours in salt and water (a tablespoon of fine salt to a quart of fresh water); this whitens the meat, and removes the residuum of dark venous blood that will otherwise give a slightly disagreeable taste, hardly definable, though existing.

3d. Fry these steaks, or stew them *a la mode*, with a few thin slices of sweet “breakfast” bacon, seasoning with pepper and salt; a rich brown gravy follows the cooking of the meat; serve hot, and it is, strictly judged, a very excellent meal for the daintiest feeder—and I hereby recommend it confidently as a safe venture for any newcomer to make.

MEAT OF THE SEA-LION.—The flesh of young sea-lions is still better than that of the fur-seal, while the natives say that the meat of the hair-seal (*Phoca vitulina*) is superior to both, being more juicy; fur-seal meat is exceedingly dry, hence the necessity of putting bacon into the frying-pan or stew-pot with it; sea-lion flesh is an improvement in this respect, and also that its fat, strange to say, is wholly clear, white, and inodorous, while the blubber of the “holluschickie” is sickening to the smell, and will, nine times out of ten, cause any civilized stomach to throw it up as quickly as it was swallowed. The natives, however, eat a great deal of it simply because they are too lazy to clean their fur-seal cuts, and not because they really relish it.

In this connection it may be well to add, that the liver of both *Callorhinus* and *Eumetopias* is sweet and wholesome; or, in other words, it is as good as liver usually is in Fulton market; the tongues are small, white, and fat; they are regularly cut out to some extent, and salted in ordinary water-buckets for exportation to curious friends; they have but slight claim to gastronomic favor. The natives are, however, very partial to the liver; but, though they like the tongues, yet they are too lazy to prepare them. A few of them, in obedience to pressing and prayerful appeals from relatives at Oonalashka, do exert themselves enough every season to undergo the extra labor of putting up a few barrels of fresh salted seal meat, which, being carried down to Illoook by the company's vessels, affords a delightful variation to the steady and monotonous codfish diet of the Aleutian islanders.

OTHER AUTHORITIES ON HAIR-SEAL MEAT.—An old writer, in describing men and things in the western islands of Scotland (Martin, 1716), does not give the same evidence of appreciation. He says that the Scotch there “salt the seals with the ashes of burnt sea-ware [algaoid melanospemæ], and say they are good food. The vulgar eat them commonly in the spring time, with a long pointed stick instead of a fork, to prevent the strong smell which their hands otherwise would have for several hours afterward. The flesh and broth of fresh young seals is, by experience, known to be pectoral. The meat is astringent, and used as an effectual remedy against diarrhea and dysentery. The liver of a seal being dried and pulverized, and afterward a little of it drank with milk, *aquavitæ*, or red wine, is also good against fluxes”.

Again, “the seal, though esteemed only fit for the vulgar, is also eaten by persons of distinction, though under a different name, to wit, ham”; also, a pleasant smile involuntarily arises to the face of the naturalist, when he learns from the same old writer that “the popish vulgar of the islands to the southward from this [island] eat these seals in Lent instead of fish”. Martin refers to *Phoca fetida*, I think.

NATIVES' USE OF FUR-SEAL FLESH MEDICINALLY.—I could not learn from the natives on the Pribylov islands that they held any notions of medicinal virtue whatever in regard to the flesh of the fur-seal or other pinnipeds indigenous. They do make certain special uses of the liver, gall, testes, etc., but the exact application I could not satisfactorily determine. They considered the establishment of our surgeon and pharmacy as a direct vote of censure upon their therapeutics, and were too willing to forget what they knew whenever I asked leading questions on the subject.

FIRST ESTABLISHMENT OF A PHARMACY: NATIVES THEIR OWN SURGEONS.—The natives, prior to the transfer of the territory, as well as the agents and employes of the old Russian company, were compelled to do their own doctoring and surgery as best they knew how, and with the scanty supply of natural and artificial resource at their command. They may be, therefore, truly described as having been helpless in the presence of serious physical ailment.

When our government took possession of Alaska, they brought with them, however, the first physicians and supplies that had ever had lodgment on the Pribylov islands, and when these officers took their departure with the troops, their services and stores were naturally suggested as desirable of continuance. Accordingly, the Alaska Commercial Company, when it took the business control of the islands, 1870-71, promptly established a doctor and a pharmacy on each island, and latterly a small hospital has been erected and sustained by it at St. Paul. These physicians are agents of the company, under salary, and are directed to give their time and attention to all illness on either island, free of charge; also, dispensing needful medicines, etc., gratis. Dr. Otto Cramer, a native of Berlin, was the surgeon on St. Paul during my sojourn there, and I recall his sad death at sea in 1875 with unfeigned regret, for he was a singularly well-read gentleman and an accomplished physician, musician, and scholarly in his mind. He was a victim to acute melancholia; some heavy shadow was hanging from his early life over him which none of us cared to lift.

STOLID BEHAVIOR OF NATIVES WHEN INJURED.—Dr. Cramer often said, speaking of the peculiarities of the natives when sick at St. Paul, that they never notified him of their illness until the diseases had usually got so firm hold of the patients as to baffle all medical relief. He complained that they would let the old shamanistic doctress of the village charm, drug, and weary the sick until death seemed imminent, and then stolidly send for him. "Ochta, mein Gott! too late, too late, such people!" he would usually conclude his account of this case or that, as it might be.

NATIVE METHODS OF COOKING.—The native cooking is now all done in their houses, on small cast-iron stoves of American pattern and make. In olden times the unavoidable use of fur-seal blubber in culinary operations caused the erection, outside of most "barrabaras", of a small sod-walled and low dirt-roofed kitchen, in which the strong-smelling blubber-fires were kindled. Indifferent as the native became to smells and smoke in the filthy life of early days upon these islands, yet the acrid, stifling, asthmatic effect of the blubber clouds never failed to punish him whenever he attempted to make use of such a fire in his living-room. Most of these "cookhnets", or "povarniks", were in full blast when I first landed at St. Paul, and coming frequently into range of their smoky effluvia, I was infinitely annoyed; now, however, the complete substitution of new frame-houses for the "barrabkies" has, I believe, caused a perfect abatement of the nuisance.

The people of the seal-islands indulge in very liberal quantities of boiled seal meat and tea; these staples, together with hard bread or soda crackers, form the routine of their bill of fare, as far as cooking goes, varied at wide intervals by boiled halibut, stewed or roasted birds, and the queerly-scrambled eggs of the same. The more ancient these oölogical viands, the better for Aleutian gusto. Some of the women, however, have learned to bake bread and biscuits, but this consumes too much of the scant fuel at their disposal to be a popular or general practice among them. They sit at tables in their houses now, on benches, and eat from plates with knives and forks, instead of squatting around an iron pot on the "barrabkie" floor to dip in *sans ceremonie* with spoons, ladles, and grimy fingers as in "ye olden tyme". They have, however, one sad failing developed by this march to a higher civilization, and that is the determination of the Aleutian dish-washer to use cold water on her greasy plates.

GREAT SIZE OF THE FUR-SEAL'S HEART: ITS EXPANDED LUNGS.—In opening many hundreds of these freshly-killed seals, after skinning, while searching in vain for supposed food-contents of their stomachs, I was impressed by the exceeding size of the heart, and the perfect organization of the lungs; while the volume of blood in proportion to the size and weight is, I am sure, greater in the fur-seal than in any other animal. The enormous lungs, and the veins laid bare, showed their beautiful adaptation to frequent aquatic submergence, by their great capacity toward the root of the heart, and by the enormous cava or hepatic reservoir. The widened aortic arch and the diminution of the abdominal aorta modify the blood-current, of which the vast muscular apparatus of the forequarters and the large brain must receive the major share of supply as it comes from the enlarged heart.*

13. MANNER OF CARING FOR AND SHIPPING THE FUR-SEAL SKINS.

CURING THE RAW SKINS.—The skins are taken from the field to the salt-house, where they are laid out, after being again carefully examined, one upon another, "hair to fat", like so many sheets of paper, with salt profusely spread upon the fleshy sides as they are piled up in the "kenches", or bins.† The salt-house is a large barn-like frame structure, so built as to afford one-third of its width in the center, from end to end, clear and open as a passage-way; while on each side are rows of stanchions, with sliding planks, which are taken down and put up in the form of deep bins, or boxes—"kenches," the sealers call them. As the pile of skins is laid at the bottom of an empty "kench", and salt thrown in on the outer edges, these planks are also put in place, so that the salt may be kept intact until the bin is filled as high up as a man can toss the skins. After lying two or three weeks in this style

* I had prepared many notes upon the muscular anatomy of the fur-seal and the sea-lion; but I find that it has been anticipated so well by what Dr. Murie published in the transactions of the Zoölogical Society of London, 1869-72, as to render their reproduction here quite superfluous. These observations of Dr. Murie constitute one of the most valuable contributions to the knowledge of the anatomy of this animal that has ever been made. He carefully dissected a young male sea-lion after its death, which had been brought to the Zoölogical Society's gardens from the Falkland islands.

† The practice of curing in early times was quite different from this rapid and effective process of salting. The skins were then all air-dried; pegged out, when "green", upon the ground, or else stretched upon a wooden trellis or frame, which stood like a rude fence



KENCHING FUR-SEAL SKINS.

Interior of the Salt-house at the village, St. Paul Island. Natives planting the pelts in the curing bins or "kenches;" salting, assorting, etc.

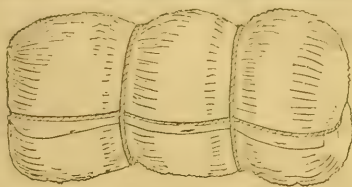
they become "pickled", and they are suited then at any time to be taken up and rolled into bundles, of two skins to the package, with the hairy side out, tightly corded, ready for shipment from the islands.

AVERAGE WEIGHT OF RAW SKINS.—The average weight of a two-year-old skin is $5\frac{1}{2}$ pounds; of a three-year-old skin, 7 pounds; and, of a four-year-old skin, 12 pounds; so that as the major portion of the catch is two or three year-olds, these bundles of two skins each have an average weight of from 12 to 15 pounds. In this shape they go into the hold of the company's steamer at St. Paul,* and are counted out from it in San Francisco. Then they are either at once shipped to London by the Isthmus of Panama in the same shape, only packed up in large hogsheads of from 20 to 40 bundles to the package, or expressed by railroad, via New York, to the same destination.

PACKING SKINS FOR SHIPMENT.—The work of bundling the skins is not usually commenced by the natives until the close of the last week's sealing; or, in other words, those skins which they first took, three weeks ago, are now so pickled by the salt in which they have been lying ever since, as to render them eligible for this operation and immediate shipment. The moisture of the air dissolves and destroys a very large quantity of the saline preservative which the company brings up annually in the form of rock-salt, principally obtained at Carmen island, Lower California.

LAW PROTECTING THE SEALS.—The Alaska Commercial Company, by the provisions of law under which they enjoy their franchise, are permitted to take 100,000 male seals annually, and no more, from the Pribilof islands. This they do in June and July of every year. After that season, the skins rapidly grow worthless, as the animals enter into shedding, and, if taken, would not pay for transportation and the tax. These natives are paid 40 cents a skin for the labor, and they keep a close account of the progress of the work every day; they do so, as it is all done by them, and they know within 50 skins, one way or the other, when the whole number have been secured each season. This is the only occupation of the 398 people here, and they naturally look well after it. The interest and close attention paid by these natives, on both islands, to the "holluschickie" and this business, was both gratifying and instructive to me during my residence there.

ERRONEOUS POPULAR IDEAS.—The common or popular notion in regard to seal-skins is, that they are worn by those animals just as they appear when offered for sale; that the fur-seal swims about, exposing the same soft



A bundle of skins.

adjacent to the killing-grounds; it was the accumulation of such air-dried skins from the Pribilof islands, at Sitka, which rotted so in 1803, that "750,000 of them were cut up, or thrown out into the sea", completely destroyed. Had they been treated as they now are, such a calamity and hideous waste could not have occurred.

The method of air-drying which the old settlers employed, is well portrayed by the practice of the natives now, who treat a few hundred seal-skins to the process every fall; preparing them thus for shipment to Oonalashka, where they are used by brother Aleuts in covering their bidarkies or kyacks.

The natives, in speaking to me of this matter, said that whenever the weather was rough and the wind blowing hard, these air-dried seal-skins, as they were tossed from the bidarra to the ship's deck, numbers of them would frequently turn in the wind and fly clean over the vessel into the water beyond, where they were lost.

Under the old order of affairs, prior to the present management, the skins were packed up and carried on the backs of the boys and girls, women and old men, to the salt-houses, or drying-frames. When I first arrived, season of 1872, a slight variation was made in this respect, by breaking a small Siberian bull into harness and hitching it to a cart, in which the pelts were hauled. Before the cart was adjusted, however, and the "buck" taught to pull, it was led out to the killing-grounds, by a ring in its nose, and literally covered with the green seal-hides, which were thus packed to the knees. The natives were delighted with even this partial assistance; but now they have no further concern about it at all, for several mules and carts render prompt and ample service. They were introduced here, first, in 1874. The Russian-American Company and also the Alaska Commercial Company have brought up three or four horses to St. Paul, but they have been unfortunate in losing them all soon after landing, the voyage and the climate combined being inimical to equine health; but the mules of the present order of affairs have been successful in their transportation to and residence on the Pribilof islands. One, the first of these horses just referred to, perhaps did not have a fair chance for its life. It was saddled one morning, and several camp-kettles, coffee-pots, etc., slung on the crupper for the use of the Russian agent, who was going up to Northeast point for a week or ten days' visit. He got into the saddle, and while *en route*, near Polovina, a kettle or pot broke loose behind, the alarmed horse kicked its rider promptly off, and disappeared on a full run, in the fog, going toward the bogs of Kamminista, where its lifeless and fox-guawed body was found several days afterward.

* The shallow depths of Bering sea give rise to a very bad surf, and though none of the natives can swim, as far as I could learn, yet they are quite creditable surfmen, and work the heavy "baidar" in and out from the landing adroitly and circumspectly. They put a sentinal upon the bluffs over Nah Speel, and go and come between the rollers as he signals. They are not graceful oarsmen under any circumstances, but can pull heartily and coolly together when in a pinch. The apparent ease and unconcern with which they handled their bidarra here in the "baroon" during the fall of 1869, so emboldened three or four sailors of the United States Revenue Marine cutter "Lincoln" that they lost their lives in that surf through sheer carelessness. The "gig" in which they were coming ashore "broached to" in the breakers just outside of the cove, and their lifeless forms were soon after thrown up by the merciless waves on the Lagoon rookery. Three graves of these men are plainly marked on the slope of the Black Bluffs.

There is a false air of listlessness and gentleness about an open sea, or roadstead roller, that is very apt to deceive even watermen of good understanding. The crushing, overwhelming power with which an ordinary breaker will hurl a large ship's boat on rocks awash, must be personally experienced ere it is half appreciated.

The bundled skins are carried from the salt-houses to the baidar, when the order for shipment is given, and pitched into that lighter one by one, to be rapidly stowed; 700 to 1,200 bundles make the average single load; then, when alongside the steamer, they are again tossed up, and on her deck, from whence they are stowed in the hold.

coat with which our ladies of fashion so delight to cover their tender forms during inclement winter. This is a very great mistake; few skins are less attractive than is the seal-skin when it is taken from the creature. The fur is not visible; it is concealed entirely by a coat of stiff overhair, dull, gray-brown, and grizzled. It takes three of them to make a lady's sacque and boa; and in order that the reason for their costliness may be apparent, I take great pleasure in submitting a description of the tedious and skillful labor necessary to their dressing ere they are fit for sale, which will be found in the appendix.

SKETCH OF THE RUSSIO-CHINA TRADE IN FUR-SEAL PELTRIES.—During the whole of the extended period, from 1799 to 1867, inclusive, the Russians shipped and sold nearly all of the fur-seal skins that were taken from the Pribylov islands, in that great international mart of Kiachta, on the Chinese frontier. Since the Americans have taken control, the sales have all been practically made in London. The Alaska Commercial Company sells every one of its skins from the Pribylov and Commander groups there, in the same wareroom where the Hudson Bay Company, when it had a thrifty existence and was a power, used to auction its furs annually. As millions of the air-dried pelts taken from the seal-islands of Alaska have been bartered in the China-Russian station, a brief description of Kiachta may be interesting.

Prior to 1722, the Russians enjoyed a treaty with China which sanctioned the individual traveling of Muscovite traders direct from the frontier to Peking; after a period of three and thirty years, the Russians were abruptly and entirely deprived of those coveted commercial privileges. After all intercourse between the two countries had ceased for five years, the Russians obtained a new treaty in 1728, by which, in order to prevent future misunderstandings, the international trade, as far at least as private individuals were concerned, should be conducted on the boundary line, exactly upon the same spot where this new treaty was negotiated. Here Kiachta was built, though she still had a rival in Peking; for, by the provisions of the new treaty, government trading caravans were allowed to penetrate to the capital of the Chinese empire. But, in 1762, Catharine the Second relinquished this imperial monopoly, and that action at once rendered this little town the grand and sole emporium of commerce between Russia and China.

DESCRIPTION OF KIACHTA.—Kiachta, then, as now, stands on a rivulet of the same name, which, rising in Siberia and crossing the frontier line, washes the foundations of Maimatschin, a China town only a few miles away. Taken by itself, it is beset on all sides by rugged mountains; and the streamlet which forms a bond of union between these large empires of Asia is so tiny that, even by the aid of damming, it often fails to afford an adequate supply of water to the four or five thousand dwellers on its banks. These two small settlements, Kiachta and Maimatschin, are situated as nearly as possible on the fiftieth parallel of latitude, being about 1,000 miles from Peking and 4,000 from Moscow. Though the Chinese route is much the shortest on the map, it is practically as hard a journey; for at a distance of about a week's march from Peking, the Chinese have a forty days' tramp, and upward, over a dismal desert of table-land. It is parched with heat during one-half of the year, and covered with snow during the other. The Russians, however, whether they come from the west with manufactured goods, or from the north and east with furs, enjoy the advantages of a peopled country and of navigable waters nearly all the way to Irkutsk, and when they have met at this, the common center of all the lines of communication, they may, and often do, prosecute the rest of their journey to the very neighborhood of Kiachta by crossing lake Baikal and ascending its principal tributary, the Selenga river.

CHARACTER OF THE TRADE.—The Russian traders bring chiefly furs, woolens, cottons, and linens, while the Chinese bring teas principally, also silks, and sugar-candy; thus the seal-skins of Alaska were wont to go first from the seal-islands to Sitka; there they were assorted and put up into square bales, about 3 feet by 2, pressing the bundles in an old fashioned hand-lever press, and cording them while under this pressure; then envelopes of green walrus hide were sewed over them, and the packages, duly numbered, went to the Okotsk by ship, then to Kiachta by pack-horses, where the buyers of Peking finally inspected and purchased them, giving in exchange the celebrated black teas of Maimatschin, the finest brands in all Mongolia, and produced only in the north of China, and which can be more cheaply transported from thence to Siberia than to Canton.

CHINESE DISPOSITION OF FUR-SEAL PELTRIES.—The Chinese buyers sent their Pribylov peltries down to their home-markets on camels, and in carts drawn by oxen, to Kalgan, where the seal-skins were again sold to other dealers, who carried them to the ultimate retail trade.

VOLUME OF KIACHTA TRADE IN 1837.—What the fur-trade of Kiachta to-day is, even though the rare skin of *Callorhinus* is seldom seen, I can find no data; but in 1837 the native land furs were represented by a value of 7,406,188 roubles, and the peltries from Russian America, including the fur-seals, sea-otter, and all the Alaskan land catch, was 1,600,000 roubles. How many fur-seals were sold in this aggregate, I cannot ascertain, but the scanty yield during the two and three years preceding would not warrant any considerable showing.

CHINESE TRADERS.—The Chinese at Kiachta were at first much more shrewd in their bargains than were their Russian neighbors; but the Slavonic instincts did not need much brushing up ere they were fully equal to all emergencies; the methods of the Chinese in selecting seal-skins were elaborate and lengthy—each pelt was handled and measured, then a little metal tag attached on which the result was recorded. I find a great deal of confusion in the data at my command as to what the average price was in this market, because the Russians took

all ages, and at all stages of the season, from June to December; consequently, the number of really prime skins was small compared with the whole aggregate sold; the best pelts brought from "10 to 15 roubles"—\$8 to \$12.50; the average sales were made, however, as low as from \$1 to \$5 per skin. Technainov gives the most information touching the value of Russian American furs in those times, that I can find; but, in regard to specific figures for the fur-seal quotations, he is only vague and general, the reason doubtless being that the whole volume of trade at Kiachta was and is exclusively one of barter, without the intervention of coin on either side.

SEASON OF KIACHTA COMMERCE.—The business life of Kiachta is never fully aroused until winter has well set in, continuing until spring. There is no written regulation to this effect, but it has the force of law through habit. In disposing of their commodities, the Chinese have considerable local advantage, because their teas never remain a single season unsold at Maimatschin, while the Russian goods, partly through a diminution of the demand, and partly through the artifices of the Celestials, are often so depreciated in value as to have to wait two and three years for a market.

DEMAND OF CHINESE FOR FURS.—The Chinese have from time immemorial been solicitous purchasers of furs. The northern provinces of their dominions are not only subjected to an extremely rigorous winter climate, but are those where the most wealthy reside, because the best teas of the Celestial Empire grow there; hence the desire for fur robes and garments as measures of comfort during cold weather is universal among the inhabitants; they constitute an important part of the wardrobe of every important Chinaman throughout all "Kathay". A Russian authority, Paul von Krusenstern, says: "With the least change of air the Chinese immediately alter their dress; and even at Canton, which is within the confines of the tropics, they wear furs in the winter."

FIRST TRAFFIC IN FURS BETWEEN AMERICA AND CHINA.—It is a curious fact, that until Captain John Gore anchored, December 18, 1779, near Canton with the ships of Cook's last voyage, from Kamchatka and the northward, the furs which these English seamen then offered to the Chinese for sale were the first peltries ever brought into their markets by sea. The Chinese had hitherto gained everything of this character from without their precincts, by overland trade with Siberian merchants, or from the Burmese frontier via Bhamo.

When Captain Gore, the surviving senior officer of Cook's last voyage, 1776-'80, returned to England, he found that war was existing with the United States, France, and Spain; the British government determined to withhold from the world all information of the voyage; hence it was not until the winter of 1784-'85 that it was published. The statements contained in this work respecting the great abundance of animals yielding fine furs on the northwest coast, and the successful pecuniary bartering of the ships at Canton, stirred up a great many active men who fitted out vessels for the traffic. The first individual trader from the south on the northwest coast, was John Hanna, an Englishman, who sailed from Canton, May, 1783, and filled his little schooner with sea-otter skins at Nootka; then Portlock and Dixon, and Meares, in 1786; Gray and Kendrick, the first Americans, in 1787, head a long list of traders who came successively after them. In no record whatever of this pelagic fur trade can I find any mention made of the skin of the fur-seal, nor the slightest hint whatever until the period of the Fraser river gold excitement, in 1862, when the first quotation of a fur-seal skin is made, taken at sea off the straits of Fuca.

WHAT THE RUSSIANS KNEW OF THE BUSINESS.—Perhaps the best, and an entirely correct, epitomé of what the Russians at headquarters of the company in Sitka really knew, biographically and commercially, of the fur-seal, is embodied in the following words of Governor Simpson, of the Hudson Bay Company, who, in 1841-'42, was the guest of Governor Etholine. He had supreme control of Alaskan life and trade then, and gave to his English official peer, doubtless, all the knowledge which he possessed:

Some twenty or thirty years ago there was a most wasteful destruction of the seal, when young and old, male and female, were indiscriminately knocked on the head. This imprudence, as any one might have expected, proved detrimental in two ways. The race was almost extirpated; and the market was glutted to such a degree, at the rate for some time of two hundred thousand skins a year, that the prices did not even pay the expenses of carriage. The Russians, however, have now adopted nearly the same plan which the Hudson Bay Company pursues, in recruiting any of its exhausted districts, killing only a limited number of such males as have attained their full growth, a plan peculiarly applicable to the fur-seal, inasmuch as its habits render the system of husbanding the stock as easy and certain as that of destroying it.

In the month of May, with something like the regularity of an almanac, the fur-seals make their appearance at the island of St. Paul, one of the Aleutian group. Each old male brings a herd of females under his protection, varying in number according to his size and strength. The weaker brethren are obliged to content themselves with half a dozen wives, while some of the sturdier and fiercer fellows preside over harems that are two hundred strong. From the date of their arrival in May to that of their departure in October, the whole of them are principally ashore on the beach. The females go down to the sea once or twice a day, while the male, morning, noon, and night, watches his charge with the utmost jealousy, postponing even the pleasures of eating and drinking and sleeping to the duty of keeping his favorites together. If any young gallant ventures by stealth among any senior chief's bevy of beauties, he generally atones for his imprudence with his life, being torn to pieces by the old fellow, and such of the fair ones as may have given the intruder any encouragement are pretty sure to catch it in the shape of some secondary punishment. The ladies are in the straw about a fortnight after they arrive at St. Paul; about two or three weeks afterward they lay the single foundation, being all that is necessary, of next season's proceeding, and the remainder of their sojourn they devote exclusively to the rearing of their young. At last the whole band departs, no one knows whither. The mode of capture is this: at the proper time the whole are driven, like a flock of sheep, to the establishment, which is a mile distant from the sea, and there the males of four years, with the exception of the few that are left to keep up the breed, are separated from the rest and killed. In the days of promiscuous massacre such of the mothers as had lost their pups would ever and anon return to the establishment, absolutely harrowing up the sympathies of the wives and the daughters of the hunters, accustomed as they were to such scenes, with their doleful lamentations.

The fur-seal attains the age of fifteen or twenty years, but not more. The females do not bring forth young till they are five years old. The hunters have frequently marked their ears each season, and many of the animals have been notched in this way ten times, but very few of them oftener.

Under the present system, the fur-seals are increasing rapidly in number. Previously to its introduction, the animal hunts had dwindled down to three and four thousand. They have now gradually got up to thrice that amount, and they are likely soon to equal the full demand, not exceeding thirty thousand skins, of the Russian government.*

It is valuable, as showing that, as long ago as 1841-42, under Russian management, more than 30,000 skins per annum would be a loss, and not profitable to take from the seal-islands. Also, that, though the tardy recognition of the fact that females should not be slaughtered was made on the Pribylov islands shortly prior to 1841-42, yet suitable regulations had not yet been made for the management of the business, inasmuch as all classes, "as a whole," were driven to the killing-grounds. This harassed and disturbed the females quite as badly as if killed outright. In 1845 the present order of implicit non-trespass upon the breeding-rookeries was first established, and I am sorry that I cannot find the name of the intelligent Russian who promulgated it, so that it might be known and respected, as it so well deserves.

NO FUR-SEALS KNOWN TO EARLY TRADE.—The homely, yet explicit, letters of William Beresford should be noticed, for he sailed from London in 1797-98, as a trader with Portlock and Dixon, and he gives, perhaps, the only straightforward synopsis of the fur-trade of the northwest coast as it was then. He reviews the subject as it presents itself to him from Cook's inlet to Cape Mendocino, in the series of field-notes which are printed and form the body and soul of *Dixon's Voyage*.

Nowhere does the author mention the fur-seal in this narrative, covering as it does two years' cruising between Kadiak and Cape Flattery. He evidently had not even heard of it, though at the time the Russians were working the Pribylov islands barbarously, taking hundreds of thousands of skins.

When I first went to the northwest coast, May, 1865, I learned from the venerable Doctor Tolmie, a recently retired chief factor of the Vancouver (Hudson Bay Company's) district, a great deal of the fur-bearing animals of that country, as known to the celebrated company which he had represented. I find no mention in my memoranda made at the time, that he indicated the skin of the fur-seal as one of the long list of items of trade; and while I was in that country between the Stikkeen mouth and Puget sound, 1865-'67, inclusive, I never heard a single word of the fur-seal, and I, myself, then never recognized its name. I do not think, therefore, it worth while to discuss the idle rumors, now prevalent to some extent, as to the "fact" that the fur-seal is breeding in some lonely nook here and there along the coast. The Indians would have known it full well a hundred years ago, and such anxious seekers after choice peltries as William Beresford and the Hudson Bay Company, would have profited accordingly.

PELAGIC FUR-SEALING A RECENT ENTERPRISE.—Fur-seals then, as now, were annually seen in all probability by the natives of the coast at sea, between Prince of Wales island and the Columbia river; but, either they were not deemed worthy of the labor in capture, or else the superior value of the sea-otter chase drew every attention of the pelagic hunters, just as it does to-day. At least I feel warranted in this conclusion, by the full and explicit details which Alexander Mackenzie gives of the furs that he saw in the natives' possession when he came overland from Montreal to the Pacific ocean in 1793. He describes the sea-otter almost exclusively. He speaks, however, of the natives having seal's flesh for sale; that it was eaten raw, "cut into chunks." Most likely this seal-meat of Mackenzie's notice was that of *Phoca vitulina*, which animal I have seen myself, nearly 100 miles up the Fraser river from the coast. However, it may have been that of the fur-seal, for he was among those savages who inhabited the islands and coast of Queen Charlotte sound, where these animals are to-day often seen sleeping or sporting in the broad reach of that open roadstead.

14. ECONOMIC VALUE OF THE SKINS, OIL, AND FLESH OF THE FUR-SEAL.

REASON WHY FUR-SEAL SKINS ARE ALL SOLD IN LONDON.—On account of the fact that the labor in this country, especially skilled labor, commands so much more per diem in the return of wages than it does in London or Belgium, it is not practicable for the Alaska Commercial Company, or any other company here, to attempt to dress and put upon the market the catch of Bering sea, which is in fact the entire catch of the whole world. Our people understand the theory of dressing these skins perfectly; but they cannot compete with the cheaper labor of the Old World. Therefore, nine-tenths nearly of the fur-seal skins taken every year are annually purchased and dressed in London, and from thence distributed all over the civilized world where furs are worn and prized.

CAUSE OF VARYING PRICES OF DRESSED SEAL-SKINS.—The great variations of the value of seal-skin sacsques, ranging from \$75 up to \$350, and even \$500, is not often due to the variance in the quality of the fur originally; but it is due to the quality of the work whereby the fur was treated and prepared for wear. For instance, the cheap sacsques are so defectively dyed that a little moisture causes them to soil the collars and cuffs of their owners, and a little exposure causes them speedily to fade and look ragged. A properly dyed skin, one that has been conscientiously and laboriously finished, for it is a labor requiring great patience and great skill, will not rub off or

*An Overland Journey Round the World, 1841-1842, Sir George Simpson, Governor-in-Chief Hudson Bay Company's territories; Philadelphia, 1847, pp. 130-131.

"crook" the whitest linen when moistened; and it will wear the weather, as I have myself seen it on the form of a sea-captain's wife, for six and seven successive seasons, without showing the least bit of dimness or raggedness. I speak of dyeing alone; I might say the earlier steps of unhairing in which the over-hair is deftly combed out and off from the skin, heated to such a point that the roots of the fur are not loosened, while those to the coarser hirsute growth are. If this is not done with perfect uniformity, the fur will never lay smooth, no matter how skillfully dyed; it will always have a rumpled, ruffled look. Therefore, the hastily-dyed sacques are cheap; and are enhanced in order of value just as the labor of dyeing is expended upon them.

GRADATION OF THE FUR OF *CALLORHINUS URSINUS*.—The gradation of the fur of *Callorhinus* may, perhaps, be best presented in the following manner:

1 YEAR OLD ♂: WELL GROWN: at July 1 of every season:

FUR fully developed as to uniform length and thickness and evenness of distribution; it is lighter in color, and softer in texture, than hereafter, during the life of the animal; average weight of skin as removed by the sealers from the carcass, 4½ pounds.

2 YEAR OLD ♂: WELL GROWN: at June 1 of every season:

FUR fully developed as to even length and thickness and uniformity of distribution; it has now attained the darker buff and fawn color, sometimes almost brown, which it retains throughout the rest of the life of the animal; it is slightly and perceptibly firmer and stiffer than it was last year, not being at all "duffy" as in the yearling dress now; average weight of skin, as taken from the body, 5½ pounds.

3 YEAR OLD ♂: WELL GROWN: at June 1 of every season:

FUR fully developed, as to even length, but a shade longer over the shoulders, where the incipient "wig" is forming; otherwise perfectly uniform in thickness and even distribution; this is the very best grade of pelt which the seal affords during its life; average weight of skin, as taken from the body, 7 pounds.

4 YEAR OLD ♂: WELL GROWN: at June 1 of every season:

FUR fully developed as to even length, except a decided advance in length and perceptible stiffness over the shoulders, in the "wig"; otherwise perfectly uniform in thickness and even distribution; this grade is almost as safe to take, and as good as is the three-year-old; average weight of skin, as removed, 12 pounds.

5 YEAR OLD ♂: WELL GROWN: at May to June 1 of every season:

FUR fully developed, but much longer and decidedly coarser in the "wig" region; otherwise, uniform in thickness and distribution; the coarseness of the fur over the shoulders and disproportionate length thereon destroys that uniformity necessary for rating A 1 in the market; in fact it does not pay to take this skin; average weight, 16 pounds.

6 YEAR OLD ♂: WELL GROWN: from May to June 1 of every season:

FUR fully developed, still longer and stiffer in the "wig" region, with a slightly thinner distribution over the post-dorsal region, and shorter; this skin is never taken—it is profitless; average weight, 25 pounds.

7 YEAR OLD AND UPWARD ♂: from May to June 1 of every season:

FUR fully developed, but very unevenly distributed, being relatively scant and short over the posterior dorsal region, while it is twice as long and very coarse in the covering to the shoulders especially and the neck and chest. Skins are valueless to the fur trade; weights, 45 to 60 pounds.

The analysis, as above, is a brief epitomé of the entire subject; only, it should be added that the female skins are as finely furred as are the best grades of the males; and also, that age does not cause the quality of their pelage to deteriorate, which it does to so marked an extent in the males. But, taking them into consideration is entirely out of the question, and ought to be so forever.

The fetal coat of the pup is composed of coarse black hair alone, the underwool not at all developed, when this is shed and the new coat put on in September and October, it is furred and haired as a yearling, which I diagnose above; this pelage has, however, no commercial value.

All the skins taken by the company for the last eight years have been prime skins, in the fair sense of the term; but, all the seal-skin sacques made therefrom have not been of the first quality, by any means.

In order that the rules and regulations and the law governing and protecting the interests of the government on these islands may be fully understood, I embody them in the appendix.

OIL OF THE FUR-SEAL.—I have spoken of the blubber, and as I mentioned it, doubtless the thought will occur, what becomes of the oil contained therein; is it all allowed to waste? A most natural query, and one that I made instantly after my first arrival on the islands. I remember seeing 40 or 50 hogsheds and tierces headed up and standing near the foot of the village hill, in which were many thousands of gallons of fur-seal oil. I asked the agent of the company when he was going to ship it; he shrugged his shoulders and said: "As soon as it will pay."

I made, during the season, careful notes as to the amount of oil represented by the blubber exposed on the 100,000 young male seal carcasses, and I found that the two and three year old "holluschickie" bodies as left by the skinner would not clean up on an average more than a half a gallon of oil; while the four-year-old males would make nearly a gallon. It should be remembered that quite a large portion of the seal's fat is taken off with the skin, as its presence thereon is necessary to that proper amalgamation and preservation by the salt when it is applied to its fresh surface in the "kenches"; hence the amount of oil represented by these carcasses every year is not much over 60,000 gallons.

CONDITION OF THE FUR-SEAL OIL MARKET.—When among the seal-oil dealers in New York city, during the month of May, in 1876, I took these notes with me and investigated the standing and the demand for fur-seal oil in their market and the markets of the world; and the statements of these oil experts and dealers were all in accord as to the striking inferiority of fur-seal oil, compared with the hair-seal and sea-elephant oil, which they dealt in largely. The inferiority of the fur-seal oil is due primarily to the offensive odor of the blubber, which

I have spoken of heretofore. This singularly disagreeable smell does not exist in the blubber of the hair-seal (*Phocidae*), the sea elephant or sea-lion, and it makes the process of refining very difficult. They said it was almost impossible to properly deodorize it and leave the slightest margin of profit for the manufacturer and the dealer. It was gummy and far darker in color than any other seal-oil, hence it possessed little or no commercial value. Then, again, when the subject of taking oil from the seal-islands of Alaska is considered, the following obstacles, in addition to the first great objection just cited, arise at once to financial success: the time, trouble, and danger in loading a vessel with oil at the islands where, on account of the absence of a harbor and the frequent succession of violent gales, a ship is compelled to anchor from a mile and a half to three miles from the coast, on which the surf is always breaking. The cost, again, of casks and cooage will amount to 10 cents per gallon; the cost of the natives' work in securing and bringing the blubber to the try-works, 10 cents per gallon; the cost of refining it, 10 cents; and the cost of transportation of a cargo of, say, 60,000 gallons will amount to nearly 20 cents per gallon; thus making a gallon of fur-seal oil aggregate in cost to the taker 50 cents, which entails upon him nothing but pecuniary loss when the cargo goes upon the market, and where it is worth only from 40 to 50 cents retail, with a dull sale at that.*

FRAGILE CHARACTER OF FUR-SEAL BONES.—I looked at the fur-seal bones, and at first sight it seemed as though a bone-factory might be established there; but a little examination of the singularly light and porous osseous structure of the *Callorhinus* quickly stilled that enterprise. The skull and larger bones of the skeleton are more like pasteboard than the bone which is so common to our minds. When dried out, the entire skeleton of a three-year-old male will not weigh seven pounds; indeed, I am inclined to think it would be much less than that if thoroughly kiln-dried, as after the fashion of the bone-mills. Therefore, although 100,000 of these skeletons bleach out and are trodden down annually, upon the Pribylov islands, yet they have not the standing for any commercial value whatsoever, considering their distance and difficulty of access from those impoverished fields where they might serve our farmers as fertilizing elements.†

DECAY OF SEAL CARCASSES.—Another singular and striking characteristic of the island of St. Paul, is the fact that this immense slaughtering-field, upon which 75,000 to 90,000 fresh carcasses lie every season, sloughing away into the sand beneath, does not cause any sickness among the people who live right over them, so to speak. The cool, raw temperature, and strong winds, peculiar to the place, seem to prevent any unhealthy effect from the fermentation of decay. The *Elymus* and other grasses once more take heart and grow with magical vigor over the unsightly spot, to which the sealing-gang again return, repeating their bateau, which we have marked before, upon this place, three years ago. In that way this strip of ground, seen on my map between the village, the east landing, and the lagoon, contains the bones and the oil-drippings and other fragments thereof, of more than 3,000,000 seals slain since 1786 thereon, while the slaughter-fields at Novastoshnah record the end of a million more.

I remember well the unmitigated sensations of disgust that possessed me when I first landed, April 28, 1872, on the Pribylov islands, and passed up from the beach, at Lukannon, to the village, over the killing-grounds; though there was a heavy coat of snow on the fields, yet each and every one of 75,000 decaying carcasses was there, and bare, having burned, as it were, their way out to the open air, polluting the same to a sad degree. I was laughed at by the residents who noticed my facial contortions, and assured that this state of smell was nothing to what I should soon experience when the frost and snow had fairly melted. They were correct; the odor along by the end of May was terrific punishment to my olfactories, and continued so for several weeks until my sense of smell became blunted

* In 1873, not having had any experience and not even knowing the views of the oil dealers themselves, I left the seal-islands believing that if the special tax which was then laid upon each gallon of oil as it might be rendered was removed, that it would pay the manufacturer, and in this way employ the natives, many days of the year otherwise idle, profitably. The company assured me that as far as its conduct in the matter was concerned, it would be perfectly willing to employ the natives in rendering fur-seal oil, and give them all the profit, not desiring itself to coin a single penny out of the whole transaction; possibly this could be done if the special tax of 55 cents per gallon was stricken off. The matter was then urged upon the Treasury Department, by myself, in October, 1873, and the tax was repealed by the department soon after. But it seems that I was entirely mistaken as to the quality and value of the oil itself. I made, to satisfy myself, a very careful investigation of the subject in 1876, going personally to the leading dealers in whale and seal oil of New York city, and they were unanimous in their opposition to handling fur-seal oil, some of them saying that they would not touch it at any price. I felt considerably chagrined, because had I known as much in 1873, I would have saved myself then, and my friends subsequently, a good deal of unnecessary trouble and profitless action.

† The bones of *Callorhinus*, though apparently strong, are surprisingly light and porous; indeed, they resemble those of *Ares* more than those commonly credited to mammalia; the osseous structure, however, of *Phoca vitulina*, the hair-seal which I examined there, side by side with that of the fur-seal, was very much more solid and weighed, bone for bone of equal age, just about one-third more, the skull especially; also the shoulder-blades and the pelvic series. If the bones of the animals were not divested of their cartilaginous continuations and connections, then the aggregate weight of the fur-seal is equal to its hairy-skinned relative; the entire skeleton of a three-year-old ♂ *Callorhinus*, completely divested by sea-leeches (*Asmphipoda*) of all flesh and fat, but with every ligamentary union and articulation perfect (the cartilaginous toe-ends all present), was just 8 pounds, and I have reason to believe that when it became air-dried and bleached it did not weigh more than 4 or 5. The bones of the older seals are relatively very much heavier, but only relatively; the frailness and fragility is constant through life, though the skulls of the old males do thicken up on their crests and about the rami of their jaws very perceptibly.

Sea-lion bones are, however, normally strong and heavy; the bone of the fur-seal is evidently stout enough, but it is singularly light, while the walrus, that dull, sluggish brute, has a massive osteological frame. I made these relative examinations more especially to ascertain something which might pass for a correct estimate of what the bony waste on the killing-grounds of the Pribylov islands amounted to annually, with a view of its possible utilization. The spongy bones of the whole 100,000 annually laid out would not render, according to my best judgment, 50 tons of dry bone-meal—an insignificant result and unworthy of further notice on these islands.

and callous to this stench by long familiarity. Like the other old residents I then became quite unconscious of the prevalence of this rich "funk", and ceased to notice it.

Those who land here, as I did, for the first time, nervously and invariably declare that such an atmosphere must breed a plague or a fever of some kind in the village, and hardly credit the assurance of those who have resided in it for the whole period of their lives, that such a thing was never known to St. Paul, and that the island is remarkably healthy. It is entirely true, however, and, after a few weeks' contact, or a couple of months' experience, at the longest, the most sensitive nose becomes used to that aroma, wafted as it is hourly, day in and out, from decaying seal-flesh, viscera, and blubber; and, also, it ceases to be an object of attention. The cool, sunless climate during the warmer months has undoubtedly much to do with checking too rapid decomposition, and consequent trouble therefrom, which would otherwise arise from the killing-grounds.

The freshly-skinned carcasses of this season do not seem to rot substantially until the following year; then they rapidly slough away into the sand upon which they rest; the envelope of blubber left upon each body seems to act as an air-tight receiver, holding most of the putrid gases that evolved from the decaying viscera until their volatile tension causes it to give way; fortunately the line of least resistance to that merciful retort is usually right where it is adjacent to the soil, so both putrescent fluids and much of the stench within is deodorized and absorbed before it can contaminate the atmosphere to any great extent. The truth of my observation will be promptly verified, if the skeptic chooses to tear open any one of the thousands of gas-distended carcasses in the fall, that were skinned in the killing-season; if he does so, he will be smitten by the worst smell that human sense can measure; and should he chance to be accompanied by a native, that callous individual, even, will pinch his grimy nose and exclaim, it is a "keesila pahknoot"!

At the close of the third season after the skinning of the seal's body, it will have so rotted and sloughed down, as to be marked only by the bones and a few of the tendinous ligaments; in other words, it requires from thirty to thirty-six months' time for a seal carcass to rot entirely away, so nothing but whitened bones remain above ground. The natives govern their driving of the seals and laying out of the fresh bodies according to this fact; for they can, and do, spread this year a whole season's killing out over the same spot of the field previously covered with such fresh carcasses three summer's ago; by alternating with the seasons thus, the natives are enabled to annually slaughter all of the "holluschickie" on a relatively small area, close by the salt-houses, and the village, as I have indicated on the map of St. Paul.

DESCRIPTION OF KILLING-GROUND OF ST. PAUL.—The killing-ground of St. Paul is a bottomless sand flat, only a few feet above high water, and which unites the village hill and the reef with the island itself; it is not a stone's throw from the heart of the settlement—in fact, it is right in town—not even suburban.

DESCRIPTION OF THE KILLING-GROUND AT ST. GEORGE.—On St. George the "holluschickie" are regularly driven to that northeast slope of the village hill which drops down gently to the sea, where they are slaughtered, close by and under the houses, as at St. Paul; those droves which are brought in from the North Rookery to the west, and also Starry Ateel, are frequently driven right through the village itself. This slaughtering field of St. George is hard tufa and rocky, but it slopes down to the ocean rapidly enough to drain itself well; hence the constant rain and humid fogs of summer carry off that which would soon clog and deprive the natives from using the ground year after year in rotation, as they do. Several seasons have occurred, however, when this natural cleansing of the ground above-mentioned has not been as thorough as must be to be used again immediately; then the seals were skinned back of the village hill, and in the ravine to the west on the same slope from the summit.

This village site of St. George to-day, and the killing-grounds adjoining, used to be, during early Russian occupation, in Pribylov's time, a large sea-lion rookery, the finest one known to either island, St. Paul or St. George. Natives are living there who told me that their fathers had been employed in shooting and driving these sea-lions so as to deliberately break up the breeding-ground, and thus rid the island of what they considered a superabundant supply of the *Eumetopias*, and thereby to aid and encourage the fresh and increased accession of fur-seals from the vast majority peculiar to St. Paul, which could not take place while the sea-lions held the land.*

*The St. Paul village site is located wholly on the northern slope of the village hill, where it drops from its greatest elevation, at the flagstaff, of 125 feet gently down to the sandy killing-flats below and between it and the main body of the island. The houses are all placed facing the north, at regular intervals along the terraced streets, which run S. E. and N. W. There are 74 or 80 native houses, 10 large and smaller buildings of the company, the treasury agent's residence; the church, the cemetery crosses, and the school building are all standing here in coats of pure white paint. The survey of the town site, when rebuilt, was made by Mr. H. W. McIntyre, of the Alaska Commercial Company, who, himself, planned and devised the entire reconstruction. No official or decaying refuse of any kind is allowed to stand around the dwellings or lie in the streets. It required much determined effort on the part of the whites to effect this sanitary reform, but now most of the natives take equal pride in keeping their surroundings clean and unpolluted.

The site of the St. George settlement is more exposed and bleak than is the one we have just referred to on St. Paul. It is planted directly on the rounded summit of one of the first low hills that rise from the sea on the north shore; indeed, it is the only hill that does slope directly and gently to the salt water on the island. Here are 24 to 30 native cottages, laid with their doors facing the opposite sides of a short street between, running also east and west, as at St. Paul. There, however, each house looks down upon the rear of its neighbor, in front and below. Here the houses face each other, on the top of the hill. The treasury agent's quarters, the company's six or seven buildings, the school-house, and the church are all neatly painted, and this settlement, from its prominent position, shows from the sea to a much better advantage than does the larger one of St. Paul. The same municipal sanitary regulations are enforced here. Those who may visit the St. George and St. Paul of to-day will find the streets dry and hard as floors. They have been covered with a thick layer of volcanic cinders on both islands.

F. THE SEA-LION (*EUMETOPIAS STELLERI*).

15. LIFE-HISTORY OF THE SEA-LION.

NATURAL INFERIORITY TO THE FUR-SEAL.—This animal, also a characteristic pinniped of the Pribylov islands, ranks much below the fur-seal in perfected physical organization and intelligence. It can, as well as its more sagacious and valuable relative, the *Callorhinus*, be seen, perhaps, to better advantage on these islands than elsewhere in the whole world that I know of. The marked difference between the sea-lion and the fur-seal up here, is striking; the former being twice the size of its cousin.

The size and strength of the northern sea-lion, *Eumetopias Stelleri*, its perfect adaptation to its physical surroundings, unites with a singular climatic elasticity of organization; it seems to be equally as well satisfied with the ice-floes of the Kamchatka sea to the northward, or the polished boulders and the hot sands of the coast of California.* It is an animal, as it appears upon its accustomed breeding-grounds at Northeast point, where I saw it, that commanded my admiration by its imposing presence and sonorous voice, rearing itself before me with head, neck, and chest upon its powerful fore-arms, over six feet in height; while its heavy bass voice drowned the booming of the surf that thundered on the rocks at its flanks.

THE PHYSICAL PRESENCE OF THE SEA-LION.—The size and strength of the adult sea-lion male will be better appreciated, when I say that it has an average length of ten and eleven feet, osteologically, with an enormous girth of eight to nine feet around the chest and shoulders; but, while the anterior parts of the frame are as perfect and powerful on land as in sea, those posterior are ridiculously impotent when the huge beast leaves its favorite element. Still, when hauled up beyond the reach of the brawling surf, as it rears itself, shaking the spray from its tawny chest and short grizzly mane, it has that leonine appearance and bearing, greatly enhanced, as the season advances, by the rich golden rufous-color of its coat, the savage gleam of its expression, due probably to the sinister muzzle and cast of its eye. This optical organ is not round and full, soft and limpid, like the fur-seal's, but it is an eye like that of a bull-dog, small, and clearly showing, under its heavy lids, the white or sclerotic coat, with a light brown iris. Its teeth gleam and glisten in pearly whiteness against the dark tongue and the shadowy recesses of its wide, deep mouth; the long, sharp, broad-based canines, when bared by the wrathful snarling of its gristled lips, glittered more wickedly, to my eye, than the keenest sword ever did in the hand of man.†

With these teeth alone, backed by the enormous muscular power of a mighty neck and broad shoulders, the sea-lion confines its battles to its kind, spurred by terrible energy and heedless and persistent brute courage. No animals that I have ever seen in combat presented a more savage or more cruelly fascinating sight than did a brace of old sea-lion bulls which met under my eyes near the Garden cove at St. George.

SEA-LIONS FIGHTING AT TOLSTOI.—Here was a sea-lion rookery, the outskirts of which I had trodden upon for the first time. These old males, surrounded by their meek, polygamous families, were impelled toward each other by those latent fires of hate and jealousy, which seemed to burst forth and fairly consume the angry rivals. Opening with a long, round, vocal prelude, they gradually came together, as the fur-seal bulls do, with averted heads, as though the sight of each other was sickening—but fight they must. One would play against the other for an unguarded moment in which to assume the initiative, until it had struck its fangs into the thick skin of its opponent's jaw; then, clenching its jaws, was not shaken off until the struggles of its tortured victim literally

* The sea-lion certainly seems to have a more elastic constitution than is possessed by the fur-seal; in other words, the former can live under greater natural extremes of climate than can the latter. A careful test of this question was made by the late R. B. Woodward, in the aquaria of his famous gardens at San Francisco. He told me at the Grand Hotel, in 1873, that he should not attempt to keep another fur-seal alive in his tanks; that every one of the half dozen live specimens which he had placed therein at different intervals during the last three years had died—began to droop and waste away as soon as they were installed in their new quarters; but he seldom lost a sea-lion, except from clear or natural reasons. Mr. Woodward, from his practical experience, was positive in his belief that no living adult fur-seal could ever be exhibited in New York; while he thought that the sea-lion, both *Zalophus* and *Eumetopias*, could be carried alive, and in good condition, all over this country from New Orleans to Montreal, or San Francisco to Bangor. He said, "Our black sea-lion (*Zalophus*) is tougher than the larger kind (*Eumetopias*), and is just the creature for showmen."

† The teeth of the fur-seal are not, as a rule, clean and white, as they are in the mouths of most carnivora; they are badly discolored by black, brown, and yellowish coatings, especially so with regard to the males; the pup's milk teeth are complete exponents of the dental formula of adolescence, but are small, brittle, mostly black and brown in color; with their shedding, however, the permanent teeth come out quite clear, and glistening white; still, again, in a year or two they rapidly lose their purity of tint, being discolored as above stated. The sea-lion pups, also, are born with dingy, dusky milk teeth, but I found that when their permanent set was grown it usually retained, even into old age, its primitive whiteness. This difference between these animals is quite marked, which, together with the opposite characters of their blubber, mentioned hereafter, constitute a very curious basis of differentiation.

The fur-seal pup, when it spits or coughs in fright, opens its mouth wide, and the small black and brown teeth seem sadly out of place, set in the bright, rosy gums around the fresh pink tinge of the tongue and under the red, flushed palate.

The canines and incisors of *Callorhinus* and *Eumetopias* are well rooted, but the molars are not; their alveoli are only partly filled, so that when the fleshy gums are removed these teeth will easily rattle out of their sockets.

In looking over hundreds and thousands of the skulls of *Callorhinus* as they bleach out on the killing-grounds, I was struck by their astonishing lack of symmetry; they varied fully as much in their extremes as the skulls of many different genera do. The number of teeth differ also; some jaws have sets of but five molars, others six, and others seven.

tore them out, leaving an ugly, gaping wound—for the sharp eye-teeth cut a deeper gutter in the skin and flesh than would have held my hand; fired into almost supernatural rage, the injured lion retaliated, quick as a flash, in kind; the hair flew from both of them into the air, the blood streamed down in frothy torrents, while high above the boom of the breaking waves and shrill deafening screams of water-fowl over head, rose the ferocious, hoarse, and desperate roar of the combatants.

LAND TRAVEL OF THE SEA-LION.—Though provided with flippers, to all external view, as the fur-seal is, the sea-lion cannot, however, make use of them at all in the same free manner. The fur-seal may be driven five or six miles in twenty-four hours, under the most favorable conditions of cool, moist weather; the "seevitchie", however, can only go two miles, the conditions of weather and roadway being the same. The sea-lion balances and swings its long and heavy neck, as a lever, to and fro, with every hitching up behind of its posterior limbs, which it seldom raises from the ground, drawing them up after the fore-feet with a slide over the grass or sand, and rocks, as the case may be; ever and anon pausing to take a sullen and savage survey of the field and the natives, who are driving them.

The sea-lion is polygamous, but it does not maintain any regular system and method in preparing for and attending to its harem, like that so finely illustrated on the breeding-grounds of the fur-seal; and it is not so numerous, comparatively speaking. There are not, according to my best judgment, over ten or twelve thousand of these animals altogether on the breeding-grounds of the Pribylov islands; it does not haul more than a few rods anywhere, or under any circumstances, back from the sea. It cannot be visited and inspected by men as the fur-seals are, for it is so shy and suspicious that, on the slightest warning of an approach, a stampede into the water is a certain result.*

PECULIAR COWARDICE OF THE SEA-LION.—That noteworthy, intelligent courage of the fur-seal, though it does not possess half the size nor one-quarter of the muscular strength of the sea-lion, is entirely wanting in the huge bulk and brain of the *Enmetopias*. A boy, with a rattle or a pop-gun, could stampede ten thousand sea-lion bulls, in the height of the breeding-season, to the water; and keep them there for the rest of the season.†

FIRST ARRIVALS.—The males come out and locate over the narrow belts of the rookery-grounds (sometimes as at St. Paul on the immediate sea-margin of the fur-seal breeding places), two or three weeks in advance of the females, which arrive later, *i. e.*, between the 1st to the 6th of June; and these females are never subjected to that intense, jealous supervision so characteristic of the fur-seal harem. The sea-lion bulls, however, fight savagely among themselves, and turn off from the breeding-ground all the younger and weaker males.

THE FEMALE SEA-LION.—The cow sea-lion is not quite half the size of the adult male; she will measure from eight to nine feet in length osteologically, with a weight of four or five hundred pounds; she has the same general cast of countenance and build of the bull; but, as she does not sustain any fasting period of over a week or ten days consecutively, she never comes out so grossly fat as the male. With reference to the weight of the latter, I was particularly unfortunate in not being able to get one of those big bulls to the scales before it had been bled; and in bleeding I know that a flood of blood poured out which should have been recorded in the weight. Therefore, I can only estimate this aggregate avoirdupois of one of the finest-conditioned adult male sea-lions at 1,400 to 1,500 pounds; an average weight, however, might safely be recorded as touching 1,200 pounds.‡

*That the sea-lion bull should be so cowardly in the presence of man, yet so ferocious and brave toward one another and other amphibious animals, struck me as a line of singular contrast with the undamted bearing of the fur seal "seacatch", which, though being not half the size, or possessing muscular power to anything like its development in the "seevitchie", nevertheless, will undiltingly face, on its station at the rookery, any man, to the death. The sea-lion bulls, certainly, fight as savagely and as desperately, one with another, as the fur-seal males do. There is no question about that; and their superior strength and size only makes the result more effective in the exhibition of gaping wounds and attendant bloodshed. I have repeatedly seen examples of these old warriors of the sea which were literally scarred, from their muzzles to their posteriors, so badly and so uniformly as to have fairly lost all the color, or general appearance even, of hair anywhere on their bodies.

I recall, in this connection, the sight of an aged male sea-lion, which had evidently been defeated by a younger and more lusty rival, perhaps; it was hauled upon a lava shelf at Southwest point, solitary and alone; the rock around it being literally covered with pools of pus, which was oozing out and trickling down from a score of festering wounds; the victim stood planted squarely on its torn fore-flippers, with head erect and thrown back upon its shoulders; its eyes were closed, and it gently swayd its sore neck and shoulders in a sort of troubled, painful day-dreaming or dozing. Like the fur-seal, the sea-lion never notices its wounds to nurse and lick them, as dogs do, or other carnivora; it never pays the slightest attention to them, no matter how grievously it may be injured.

† This marked cowardice of the sea-lion was well noted by Steller, who speaks of it thus: "Though the males have a terrible aspect, yet they take flight on the first appearance of man; and if surprised in their sleep, they are panic struck, sighing deeply, and in their attempt to escape get quite confused, tumble down, and tremble so much that they are scarcely able to move their limbs. If, however, reduced to extremity, they grow desperate, turn on their enemy with great fury and noise, and put even the most valiant to flight."—*Nor. Com. Acad. Sci. Petropolj*, tome ii, 1749.

‡ Often, when the fur-seal and sea-lion bulls haul up in the beginning of the season, examples among them which are inordinately fat will be seen; their extra avoirdupois renders them very conspicuous, even among large gatherings of their kind; they seem to exhibit a sense of self-oppression then, quite as marked as is that subsequent air of depression worn when, later, they have starved out this load of surplus blubber, and are shambling back to the sea, for recuperation and rest.

I thought over and devised many plans to kill and weigh entire one of these unusually heavy bulls; but, they all failed, because I did not have the time to spare from so many other observations pressing and necessary to be made at that season, if made at all during the year. The united effort of five or six men, aided by the mule and cart at St. Paul, would solve the problem, doubtless, almost any day they set about

ORGANIZATION OF SEA-LION ROOKERIES.—The sea-lion rookery will be found to consist of about ten to fifteen females to every male. The females, in landing, seem to be influenced by no preference for one male above another, but are actuated solely to come ashore at a suitable place, where, soon after landing, they are to bring forth their young. The cow seems at all times to have the utmost freedom in moving from place to place; and also often to start with its young—which is noteworthy, inasmuch as I never saw it among the fur-seals—picking the pup up by the nape and carrying it to the water to play with it for short spells in the surf wash. The pup sea-lions are by no means helpless when they are born; when they first come into the world their eyes are promptly opened wide and clear; they stand up quite free and strong on their odd flipper feet, and commence at once, in their frequent intervals of wakefulness, to crawl over boulders and the sand, to paddle in the surf, and to roar huskily and shrilly at their parents.

GROWTH OF YOUNG SEA-LIONS.—They are fed upon the richest of rich milk, at irregular and somewhat lengthy periods; reared in this manner, the young sea-lion grows with surprising rapidity, so much so that its weight, of 9 or 12 pounds at birth, is increased to 75 or 90, in less than four months thereafter. By this time, also, it has shed its natal coat and teeth; it has grown a strong mustache, and has become a facile swimmer and expert fisherman, though at first it was one of the most clumsy, yet never so helpless as the fur-seal. The liquid, pearly-blue eye of the little fellow is soon changed into the sinister expression of adolescence, when it has rounded its second year. It appears to grow up unnoticed by its grim-looking parents, though the maternal attention is more evident, but still scant, indeed, when contrasted with the love evinced by cat or dog for its offspring.

VISITING THE TOLSTOI ROOKERY.—At the east end of St. George island, just to the southward of Tolstoi Mees, is one of the finest sea-lion rookeries on the islands, or, perhaps, in the world. It lies at the base of a frowning wall of precipitous cliffs, the mural walls sheer aloft 400 and 500 feet as they overhang the sea. Here beneath, on a rocky stretch of beach some 30 or 40 feet wide, at high-water mark, stowed thickly side by side, end to end, and crosswise for a distance of half a mile up and down the coast, are four or five thousand sea-lions of all sizes and both sexes; and here they will be found every summer, secure from the approach of enemies by land. Inasmuch as they rest there under the cliffs, they cannot be practically approached and driven, as their kind are by the Aleuts, from their more accessible breeding-haunts at Northeast point, St. Paul island.*

By paying attention to the direction of the wind, the observer can descend at intervals from the heights above, unheeded and unsuspected by them, to within a stone's throw of their tawny forms; where you may notice their thousand and one unconstrained and peculiar maneuvers, which would be interrupted at once by a tumultuous and universal rush for the water should you make yourself known. You will be impressed, first, by their excessive restlessness; they are ever twisting and turning, coiling and uncoiling themselves over the rocks; now stretched out prone in slumber, the next minute up and moving. The roar of one is instantly caught up by another, so that the aggregate sound, as it rises and falls from this rookery, reverberating along the bluffs at irregular though close intervals, can only be compared, in my mind, to the hoarse sound of a tempest as it howls through the rigging of a ship, or sighs through the branches of a forest growth.

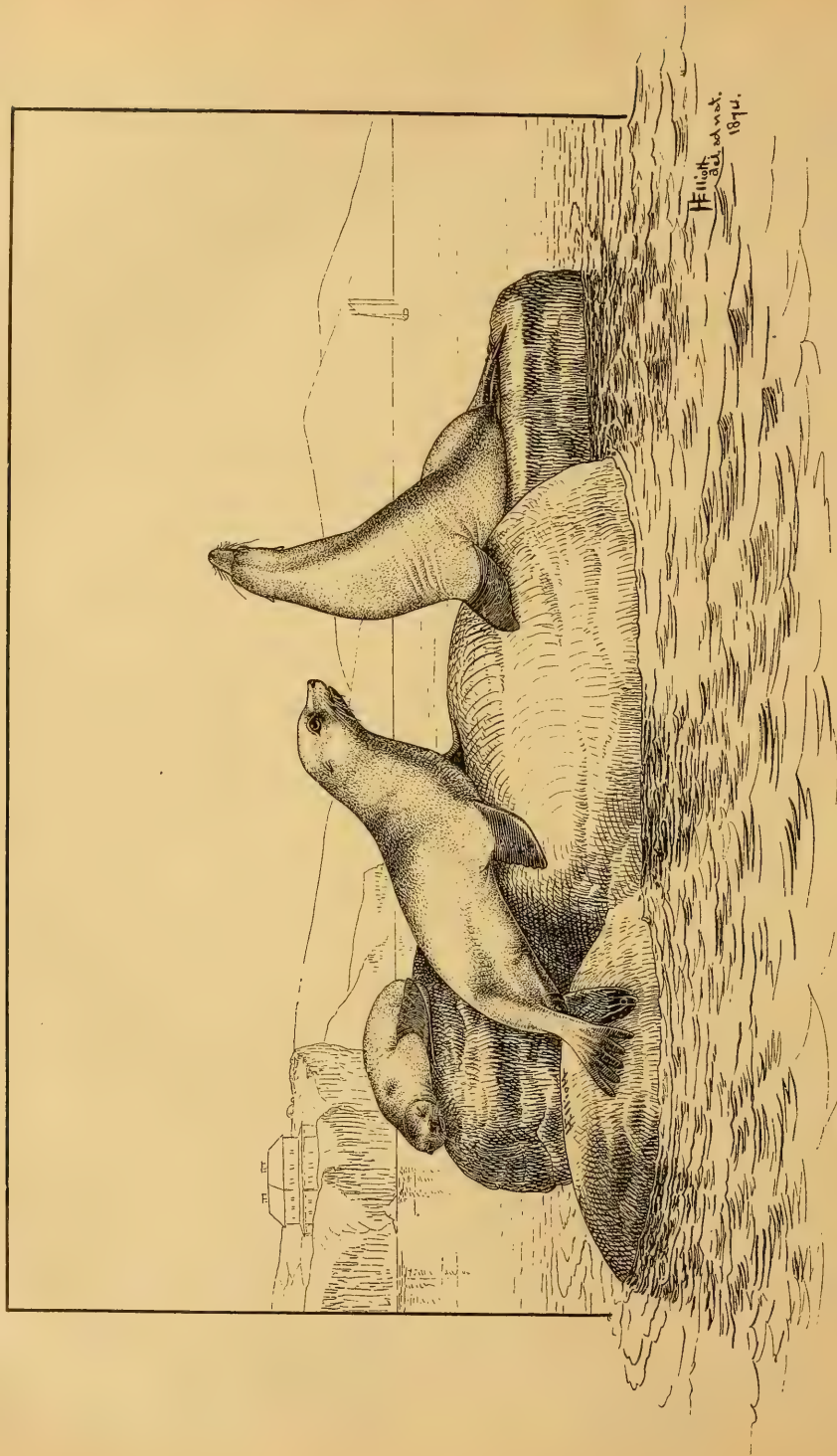
The voice of the northern sea-lion, *Eumetopias*, is confined to either a deep, resonant roar, or a low, muttering growl; not only to the males alone is this monotone peculiar, but also to the females and the young. It does not have that striking flexibility of the *Callorhinus*, and in this respect their vocal organization is very marked and different from that of the fur-seal. I might say, further, that the pups are exceedingly playful, but, unlike the noisy "koticie", they are almost silent; when they utter a sound it is a short, sharp, querulous growling.

it, early in May. Some of these super-fleshy fur-seal males look as though they were from 600 to 700 pounds weight, while I have seen several sea-lion bulls that actually appeared equal to turning the scales at 1,500 pounds avoirdupois. Those fur-seals which I did weigh in July, 1873, and September, 1872, were not at all extra fleshy, and consequently do not give a fair return for these examples above referred to.

* It will be noticed that I have made no especial spacing or reservation on my maps for the sea-lions at Northeast point, on St. Paul island, but have included them solidly within the lines of the breeding fur-seals. The reason why I omit these lines of exact limitation is due to the fact that they laid in, along the water's edge at intervals, so closely with the fur-seals, and in such apparent good fellowship, that I could not observe any sharp demarcation between them; except only the irregular, confused patches of their bright golden coats in contrast with the dull rusty dress of *Callorhinus*. The *Eumetopias*, here, where it was breeding, never lay far back from the surf, but always close to its high-water washings; in this method, I should judge, about 12,000 to 15,000 of them occupy little strips of Novastoshnah and Seevitchie Kammin; being the only rookery spots on the Pribylov islands where they breed in close juxtaposition with the fur-seals. Then, there is a sea-lion rookery on St. George, all to itself, under the high mural walls just north of the Garden cove sand beach, where I estimate another 4,000 to 5,000 of these animals annually haul out and breed. Very likely my allowance of 12,000 to 15,000 sea-lions on St. Paul is too large, and 10,000 is a better figure of their numerical expression. My published estimates of 25,000 on the two islands, in 1874, I feel now are larger than the facts allow.

As might be inferred, the sea-lions at Novastoshnah do not allow the fur-seals to disturb them, nor do they in turn ever appear to annoy or drive their physically weaker brethren; they seem to wear an air of perfect unconcern for each other; although the fur-seal bulls, I observed, were never caught lounging over the narrow littoral margins of the sea-lions' breeding-grounds; but meekly bowed their heads and scuttled across, wholly beneath the notice of the huge "seevitchie".

Why the sea-lion should be relatively so scant in numbers over the great extent of the large geographical area wherein it is found, is perplexing to me, for, it is physically as active and much more powerful than the fur-seal; perhaps, this increased bulk of body deters it from feeding as successfully as its more lithesome cousin does. I should estimate that the full-grown sea-lion bull, after it leaves the islands at the end of the breeding-season, until it reappears for the next, would require at least 100 pounds of fish per diem, while the females and younger males would crave and consume from 40 to 60 pounds of such food every twenty-four hours.



Yearling.

Female.

THE BLACK SEA-LION.

(*Zalophus Gillespii*.)

The author's life-studies of a four-year-old male, an adult female, and a yearling, at San Francisco, Cal. (Woodward's Gardens).

THE YOUNG PROMPTLY DESERTED.—You will notice that if you disturb and drive off any portion of the rookery, by walking up in plain sight, those nearest to you will take to the water, instantly swim out to a distance of fifty yards or so, leaving their pups behind, helplessly sprawled around and about the rocks at your feet. Huddled up all together in the water in two or three packs or squads, the startled parents hold their heads and necks high out of the sea, peering keenly at you, and all roaring in an incessant concert, making an orchestra to which those deep sonorous tones of the organ in that great Mormon tabernacle, at Salt Lake City, constitute the fittest and most adequate resemblance.

MOVEMENTS WHEN UNDISTURBED ON ROOKERY.—You will witness an endless tide of these animals traveling to the water, and a steady stream of their kind coming out, if you but keep in retirement and do not disturb them. When they first issue from the surf they are a dark chocolate-brown and black, and glisten; but, as their coats dry off, the color becomes an iron-gray, passing into a bright golden rufous, which covers the entire body alike—shades of darker brown on the pectoral patches and sterno-pectoral region. After getting entirely dry, they seem to grow exceedingly uneasy, and act as though oppressed by heat, until they plunge back into the sea, never staying out, as the fur-seal does, day after day and week after week. The females and the young males frolic in and out of the water, over rocks awash, incessantly one with another, just as puppies play upon the green sward; and, when weary, stretch themselves out in any attitude that will fit the character of the rock, or the lava-shingle upon which they may happen to be resting; the movements of their supple spines, and ball-and-socket joint attachments, permit of the most extraordinary contortions of the trunk and limbs, all of which, no matter how distressing to your eyes, they seem actually to relish. But, the old battle-scarred bulls of the harem stand or lie at their positions day and night without leaving them, except to take a short bath when the coast is clear, until the end of the season.

METHOD OF SWIMMING.—When swimming, the sea-lion only lifts its head above the surface long enough to take a deep breath, and then drops down a few feet below, and propels itself, for about ten or fifteen minutes, like a cigar-steamer, at the rate of 6 or 7 knots, if undisturbed; but, if chased or alarmed, it seems fairly to fly under water, and can easily maintain for a long time a speed of 14 or 15 miles per hour. Like the fur-seal, its propulsion through the water is the work entirely of the powerful fore-flippers, which are simultaneously struck out, both together, and back against the water, feathering forward again to repeat, while the hind-flippers are simply used as a rudder oar in deflecting the ever-varying swift and abrupt course of the animal. On land the hind-flippers are employed just as a dog does his feet in scratching fleas—the long peculiar toe-nails thereof seeming to reach and comb the spots affected by vermin, which annoys them, as it does the fur-seal to a great extent, and causes them both to enjoy a protracted scratching.

Again, both genera, *Callorhinus* and *Eumetopias*, are happiest when the surf is strongest and wildest; just in proportion to the fury of a gale, so much the greater joy and animation of these animals. They delight in riding on the crests of each dissolving breaker up to the moment when it fairly foams over the iron-bound rocks; at that instant they disappear like phantoms beneath the creamy surge to reappear on the crown of the next mighty billow.

When landing, they always ride on the surf, so to speak, to the objective point, and it is marvelous to see with what remarkable agility they will worm themselves up steep, rocky landings, having an inclination greater than 45°, to those bluff tops above, which have an almost perpendicular drop to water.

THE VALUE OF THE SEA-LION, COMMERCIALY: SHEDDING.—As the sea-lion is without fur, its skin has little or no commercial value.* The hair is short, an inch to an inch and a half in length, being longest over the nape of the neck; straight, and somewhat coarse, varying in color as the season comes and goes. For instance, when the *Eumetopias* makes its first appearance in the spring and dries out after landing, it has then a light brownish rufous-tint, with darker shades back and under the fore flippers and on the abdomen; by the expiration of a month or six weeks, about the 15th of June generally, this coat will then be weathered into a glossy rufous, or ochre; and this is soon before shedding, which sets in by the middle of August, or a little earlier. After the new coat has fairly grown, and just before the animal leaves the island for the sea in November, it is a light sepia or vandyke brown, with deeper shades, almost black, upon the abdomen. The cows after shedding never color up so darkly as the bulls; but when they come back to the land next year they return identically the same in tinting; so that the eye, in glancing over a sea-lion rookery during June and July, cannot discern any dissimilarity in color, at all noteworthy, existing between the coats of the bulls and the cows; and also the young males and yearlings appear in the same golden-brown and ochre, with here and there an animal which is noted as being spotted somewhat like a leopard, the yellow rufous-ground predominating, with patches of dark-brown, blotched, and mottled irregularly

*The sea-lion and hair-seals of Bering sea, having no commercial value in the eyes of civilized men, have not been subjects of interest enough to the pioneers of those waters for mention in particular; such record, for instance, as that given of the walrus, the sea-otter, and the fur-seal. Steller was the first to draw the line clearly between them and seals in general, especially defining their separation from the fur-seal; still, his description is far from being definite or satisfactory in the light of our present knowledge of the animal.

In the South Pacific and Atlantic the sea-lion has been curiously confounded by many of the earliest writers with the sea-elephant, *Macrorhinus leoninus*, and its reference is inextricably entangled with the fur-seal at the Falklands, Kerguelen's Land, and the Crozettes. The proboscidean seal, however, seems to be the only pinniped which visits the Antarctic continent; but that is a mere inference of mine, because so little is known of those ice-bound coasts, and Wilkes, who gives the only record made of the subject, saw no other animal there save this one.

interspersed over the anterior regions down to those posterior. I have never seen any of the old bulls or cows thus mottled, and this is likely due to some irregularity of shedding in the younger animals; for I have not noticed it early in the season, and it seems to fairly fade away so as not to be discerned on the same animal at the close of its summer solstice. Many of the old bulls have a grizzled or "salt and pepper" look during the shedding period, which is from the 10th of August up to the 10th or 20th of November. The pups, when born, are a rich dark-chestnut brown; this coat they shed in October, and take one much lighter in its stead; still darker, however, than their parents.

ARRIVAL AT AND DEPARTURE FROM THE PRIBYLOV ISLANDS.—The time of arrival at, stay on, and departure from, the islands, is about the same as that which I have recorded as characteristic of the fur-seal; but, if the winter is an open, mild one, some of the sea-lions will frequently be seen about the shores during the whole year; and then the natives occasionally shoot them, long after the fur-seals have entirely disappeared.

GREAT RANGE OF SEA-LION: IT IS NOT RESTRICTED TO THE SEAL-ISLANDS—Again, it does not confine its landing to the Pribylov islands alone, as the fur-seal unquestionably does, with reference to such terrestrial location in our own country. On the contrary, it is a frequent visitor to almost all of the Aleutian islands, and ranges, as I have said before, over the mainland coast of Alaska, south of Bristol bay, and about the Siberian shores to the westward, throughout the Kuriles and the Japanese northern waters.*

DIFFERENCES BETWEEN ZALOPHUS AND EUMETOPIAS.—When I first returned, in 1873, from the seal-islands, those authors, whose conclusions were accepted prior to my studies there, had agreed in declaring that the sea-lion, so common off the port of San Francisco, was the same animal also common in Alaska, and the Pribylov islands in especial; but my drawings from life, and studies, quickly pointed out the error, for it was seen that the creature most familiar to the Californians was an entirely different animal from my subject of study on the seal-islands. In other words, while scattered examples of the *Eumetopias* were, and are, unquestionably about and off the harbor of San Francisco, yet nine-tenths of the sea-lions there observed were a different animal—they were the *Zalophus Californianus*. This *Zalophus* is not much more than half the size of *Eumetopias*, relatively; it has the large, round, soft eye of the fur-seal, and the more attenuated Newfoundland-dog-like muzzle; and it never roars, but breaks out incessantly with a *honk, honk, honking* bark, or howl.

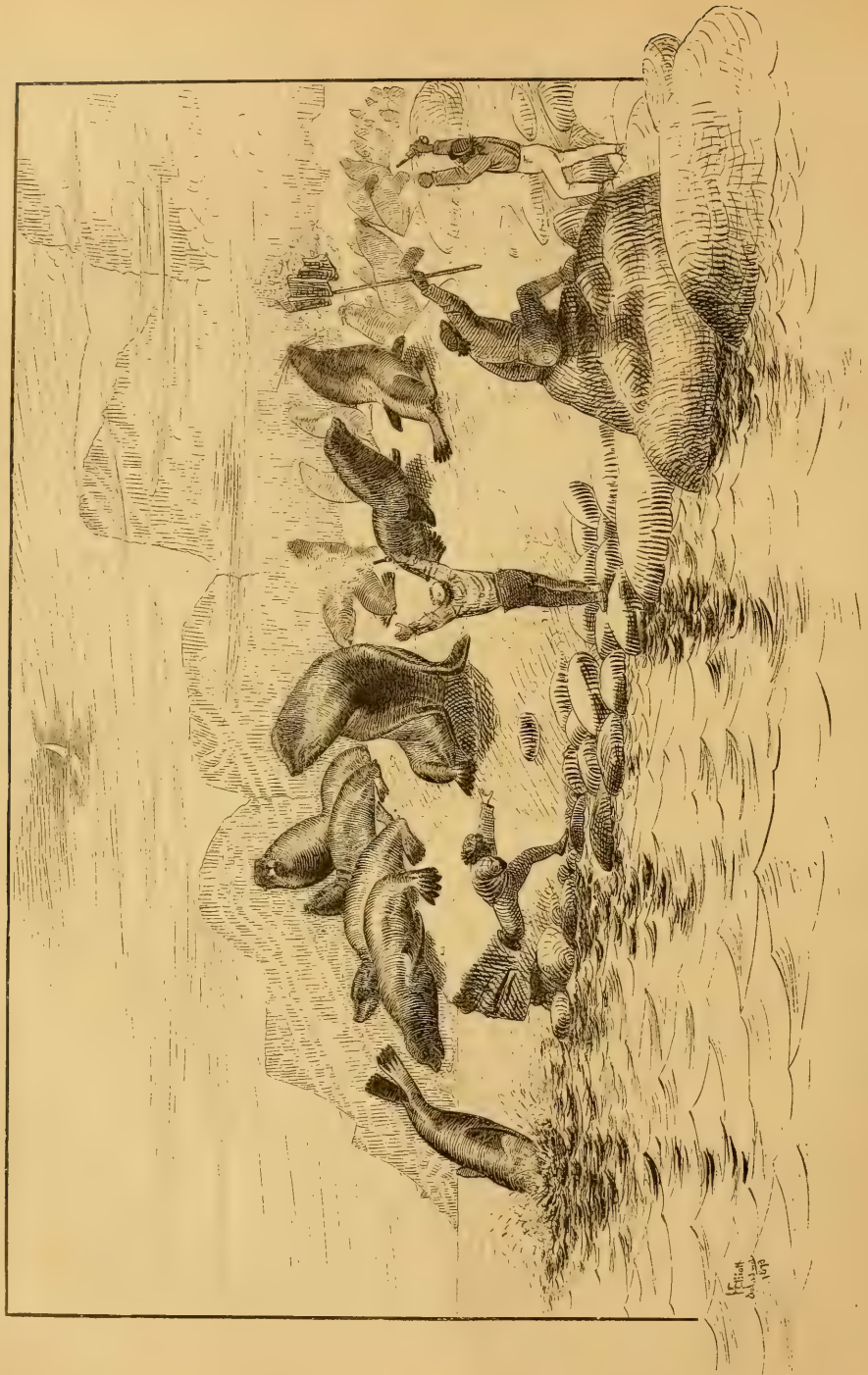
No example of *Zalophus* has ever been observed in the waters of Bering sea, nor do I believe that it goes northward of Cape Flattery.

EARLY DISPOSITION OF SEA-LIONS ON ST. GEORGE.—According to the natives of St. George, some fifty or sixty years ago the *Eumetopias* held almost exclusive possession of the island, being there in great numbers, some two or three hundred thousand strong; and they aver, also, that the fur-seals then were barely permitted to land by these animals, and in no great number; therefore, they say, that they were directed by the Russians (that is, their ancestry) to hunt and worry the sea-lions off from the island, the result being that, as the sea-lions left, the fur-seals came, so that to-day they occupy nearly the same ground which the *Eumetopias* alone covered sixty years ago. I call attention to this statement of the people because it is, or seems to be, corroborated in the notes of a French naturalist and traveler, who, in his description of the island of St. George, which he visited fifty years ago, makes substantially the same representation;† but directly to the contrary, and showing how difficult it is to trace these faint records of the facts, I give the account as rendered by Bishop Veniaminov, which I translate and place in my appendix. The reader will notice that the Russian author differs entirely from the natives and the Frenchman; for, by his tabulation, almost as many fur-seals were taken on St. George during the first years of occupation as were taken from St. Paul; and according to these figures, again continued, the

* The winter of 1872-73, which I passed on the Pribylov islands, was so rigorous that the shores were ice-bound and the sea covered with flocs from January until the 28th of May; hence, I did not have an opportunity of seeing, for myself, whether the sea-lion remains about its breeding-grounds there throughout that period. The natives say that a few of them, when the sea is open, are always to be found, at any day during the winter and early spring, hauled out at Northeast point, on Otter island, and around St. George. They are, in my opinion, correct; and, being in such small numbers, the "seevitchie" undoubtedly find enough subsistence in local crustacea, pises, and other food. The natives, also, further stated that none of the sea-lions which we observe on the islands during the breeding-season leave the waters of Bering sea from the date of their birth to the time of their death. I am also inclined to agree with this proposition, as a general rule, though it would be strange if Pribylov sea-lions did not occasionally slip into the North Pacific, through and below the Aleutian chain, a short distance, even to traveling as far to the eastward as Cook's inlet. *Eumetopias Stelleri* is well known to breed at many places between Attou and Kadiak islands. I did not see it at St. Matthew, however, and I do not think it has ever bred there, although this island is only 200 miles away to the northward of the seal-islands—too many polar bears. Whalers speak of having shot it in the ice-packs in a much higher latitude, nevertheless, than that of St. Matthew. I can find no record of its breeding anywhere on the islands or mainland coast of Alaska north of the 57th parallel or south of the 53d parallel of north latitude. It is common on the coast of Kamchatka, the Kurile islands, and the Commander group, in Russian waters.

There are vague and ill-digested rumors of finding *Eumetopias* on the shores of Prince of Wales and Queen Charlotte islands in breeding-rookeries; I doubt it. If it were so, it would be authoritatively known by this time. We do find it in small numbers on the Farrallone rocks, off the entrance to the harbor of San Francisco, where it breeds in company with, though sexually apart from, an overwhelming majority of *Zalophus*; and it is creditably reported as breeding again to the southward, on the Santa Barbara, Guadalupe, and other islands of southern and Lower California, consorting there, as on the Farrallones, with an infinitely larger number of the lesser-bodied *Zalophus*.

† Choris: *Voyage Pittoresque autour du Monde*.



SPRINGING THE ALARM.

Natives capturing Sea-lions (*Eumetopias Stelleri*), Pribylov Islands.

catch never has been less than one-sixth of the number of the quota on the larger island. Thus the two authors seem to stand each other off, and I am thrown back to the ground itself for an answer, which I am inclined to believe will be correct, when I say that the island of St. George never was resorted to in any great numbers by the fur-seal, and that the sea-lion was the dominant animal there until disturbed and driven from its breeding-grounds by the people, who naturally sought to encourage its more valuable relative by so doing, and made room, in this way, for it.

16. CAPTURE OF THE SEA-LION.

THE DRIVING ON ST. PAUL.—The great intrinsic value to the domestic service of the Aleuts rendered by the flesh, fat, and sinews of this animal, together with its skin, arouses the natives of St. Paul and St. George, who annually make a drive of "seevitchie", by which they capture, on the former island, two or three hundred, as the case may be. On St. George, driving is so much more difficult, owing to the character of the land itself, that very few are secured there; but, at St. Paul unexceptional advantages are found on Northeast point for the capture of these shy and wary brutes. The natives of St. Paul, therefore, are depended upon to secure the necessary number of skins required by both islands for their boats, and other purposes. This capture of the sea-lion is the only serious business which the people have on St. Paul; it is a labor of great care, industry, and some physical risk for the Aleutian hunters.*

By reference to my sketch-map of Northeast point rookery, the observer will notice a peculiar neck or boot-shaped point, which I have designated as Sea Lion neck. This area is a spot upon which a large number of sea-lions are always to be found during the season. As they are so shy, and sure to take to water upon the appearance or presence of man near by, the natives adopt this plan:

PREPARATIONS FOR THE DRIVE.—Along by the middle or end of September, as late sometimes as November, and after the fur-seal rookeries have broken up for the season, fifteen or twenty of the very best men in the village are selected, by one of their chiefs, for a sea-lion rendezvous at Northeast point; they go up there with their provisions, tea and sugar, and blankets, and make themselves at home in the *barrabboras* and houses, which I have located on the sketch-map of Novastoshnah, prepared to stay, if necessary, a month, or until they shall get the whole drove together of two or three hundred sea-lions.

METHODS OF DRIVING SEA LIONS.—The "seevitchie", as the natives call these animals, cannot be approached successfully by daylight, so these hunters lie by, in this house of Webster's, until a favorable night comes along—one in which the moon is partially obscured by drifting clouds, and the wind blows over them from the rookery where the sea-lions lie; such an opportunity being afforded, they step down to the beach at low water, and proceed to creep on all-fours over the surf-beaten sand and boulders up to the dozing herd, and between it and the high-water mark where it rests. In this way, a small body of natives, crawling along in Indian file, may pass unnoticed by the sea-lion sentries, which doubtless, in the uncertain light see, but confound, the forms of their human enemies with those of seals. When the creeping Aleuts have all reached the strip of beach that is left bare by ebb-tide, which is between the water and the unsuspecting animals, at a given signal from their crawling leader they all at once leap to their feet, shout, yell, brandishing their arms, and firing off pistols, while the astonished and terrified lions roar and flounder in all directions.

BEHAVIOR OF THE SEA-LIONS WHEN SURPRISED.—If, at the moment of surprise, the brutes are sleeping with their heads pointed toward the water, they rise up in fright and charge straight on in that way directly over the men themselves, but if their heads have been resting at this instant pointed landward, up they rise and follow that course just as desperately, and nothing will turn them either one way or the other; those sea-lions which charged for the water are lost, of course;† but the natives promptly follow up the land-turned animal with a rare

* A curious, though doubtless authentic, story was told me, in this connection, illustrative of the strength and energy of the sea-lion bull when at bay. Many years ago (1847), on St. Paul island, a drive of September sea-lions was brought down to the village in the usual style; but when the natives assembled to kill them, on account of the great scarcity, at that time, of powder on the island, it was voted best to lance the old males also, as well as the females, rather than shoot them in the customary style. The people had hardly set to work at the task when one of their number, a small, elderly, though tough, able-bodied Aleut, while thrusting his lance into the "life" of a large bull, was suddenly seen to fall on his back, directly under the huge brute's head; instantly the powerful jaws of the "seevitchie" closed upon the waistband, apparently, of the native, and, lifting the yelling man aloft, as a cat would a kitten, the sea-lion shook and threw him high into the air, away over the heads of his associates, who rushed up to the rescue, and quickly destroyed the animal by a dozen furious spear-thrusts, yet death did not loosen its clenched jaws, in which were the tattered fragments of Ivan's clothing.

† The natives appreciate this peculiarity of the sea-lion very keenly, for good and sufficient cause, though none of them have ever been badly injured in driving, or "springing the alarm". I camped with them for six successive nights in September, 1872, in order to witness the whole procedure. During the several drives made while I was with them, I saw but one exciting incident; everything went off in the orthodox manner, as described in the text above. The exceptional incident occurred during the first drive of the first night, and rendered the natives so cautious that it was not repeated. When the alarm was sprung, old Luka Mandrigan was leading the van, and at that moment, down upon him, despite his wildly gesticulating arms and vociferous yelling, came a squad of bull "seevitchie". The native saw instantly that they were pointed for the water, and, in his sound sense, turned to run from under, his tarbosar slipped upon a slimy rock awash, he fell flat as a flounder, just as a dozen or more big sea-lions plunged over and on to his prostrate form in the shallow water. In less time than this can be written, the heavy pinnipeds had disappeared, while the bullet-like head of old Luka was quickly raised, and he trotted back to us with an alternation of mirth and chagrin in his voice; he was not hurt in the least.

combination of horrible noises and demoniacal gesticulations, until the first frenzied spurt and exertions of the terrified creatures so completely exhaust them that they fall panting, gasping, prone upon the earth, extended in spite of their huge bulk and powerful muscles, helpless, and at the mercy of their cunning captors; who, however, instead of slaying them as they lie, rudely rouse them up again, and urge the herd along to the house, in which they have been keeping this watch during the several days past.

THE "CORRAL".—Here, at this point, is a curious stage in the proceedings. The natives drive up to that "Webster's" house the 25 or 30 or 40 sea-lions, as the case may be, which they have just captured—they seldom get more at any one time—and keep them in a corral or pen right by the barrabborra, on the flattened surface of a sand-ridge, in the following comical manner: when they have huddled up the "pod", they thrust stakes down around it at intervals of 10 to 30 feet, to which strips of cotton cloth are fluttering as flags, and a line or two of sinew-rope, or thong of hide, is strung from pole to pole around the group, making a circular cage, as it were; within this flimsy circuit the stupid sea-lions are securely imprisoned; and though they are incessantly watched by two or three men, the whole period of caging and penning which I observed, extending over nine or ten days and nights, passed without a single effort being made by the "seevitchie" to break out of their flimsy bonds; and it was passed by these animals not in stupid quiescence, but in alert watchfulness; writhing, twisting, turning one upon and over the other.

By this method of procedure, after the lapse usually of two or three weeks, a succession of favorable nights will have occurred; and the natives secure their full quota, which, as I have said before, is expressed by a herd of two or three hundred of these animals.

PREPARATION AND METHOD OF DRIVING TO THE VILLAGE.—The complement filled, the natives prepare to drive their herd back to the village, over the grassy and mossy uplands and intervening stretches of sand-dune tracts, fully eleven miles, preferring to take the trouble of prodding the clumsy brutes, wayward and obstinate as they are, rather than to pack their heavy hides in and out of boats; making, in this way, each sea-lion carry its own skin and blubber down to the doors of their houses in the village. If the weather is normally wet and cold, this drive, or caravan of sea-lions, can be driven to the point of destination in five or six days; but, should it be dry and warmer than usual, three weeks, and even longer, will elapse before the circuit is traversed.

When the drive is started the natives gather around the herd on all sides, save the opening which they leave pointing to the direction in which they desire the animals to travel; and, in this manner they escort and urge the "seevitchie" on to their final resting and slaughter near the village. The young lions and the females being much lighter than the males, less laden with fat or blubber, take the lead; for they travel twice and thrice as easy and as fast as the old males; which, by reason of their immense avoirdupois, are incapable of moving ahead more than a few rods at a time, when they are completely checked by sheer loss of breath, though the vanguard of the females allures them strongly on; but, when an old sea-lion feels his wind coming short, he is sure to stop, sullenly and surlily turning upon the drivers, not to move again until his lungs are clear.

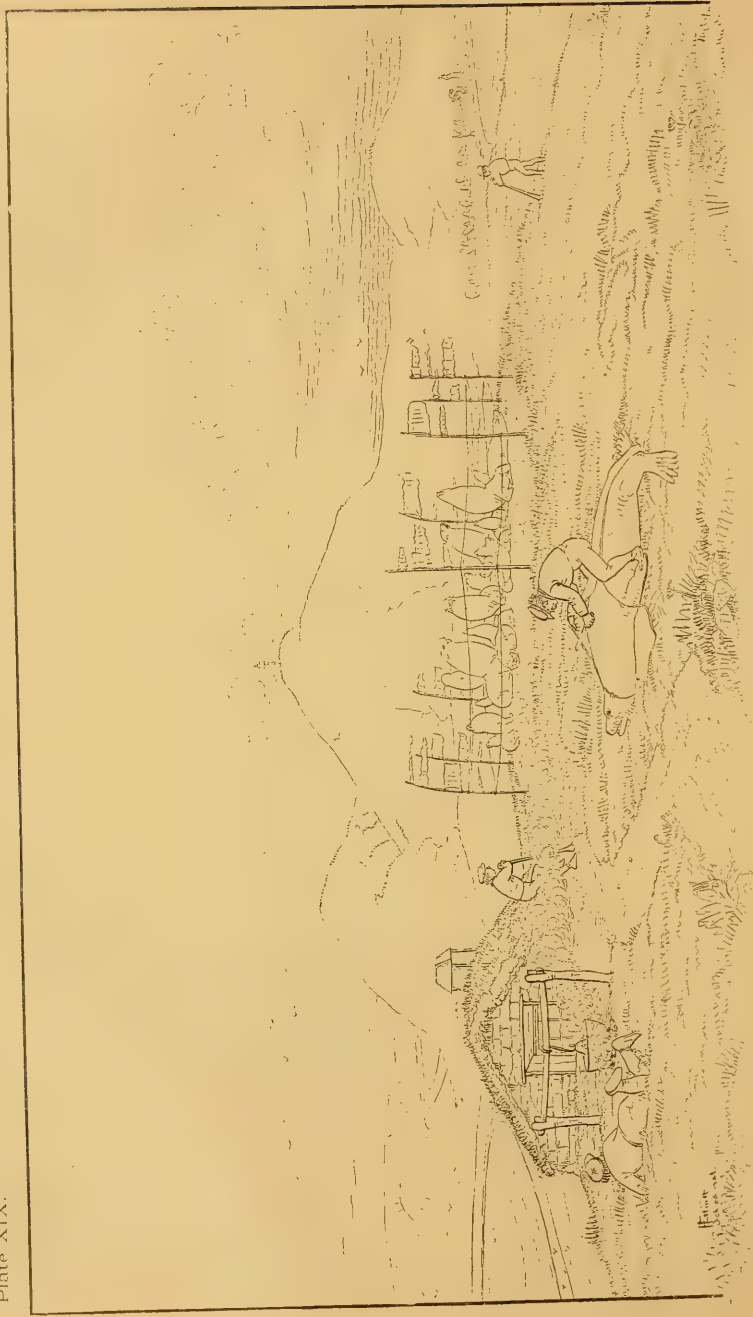
In this method and manner of conduction the natives stretch the herd out in extended file, or, as a caravan, over the line of march, and, as the old bulls pause to savagely survey the field and catch their breath, showing their wicked teeth, the drivers have to exercise every art and all their ingenuity in arousing them to fresh efforts. This they do by clapping boards and bones together, firing fuses, and waving flags; and, of late, and best of all, the blue gingham umbrella repeatedly opened and closed in the face of an old bull has been a more effective starter than all the other known artifices or savage expedients of the natives.*

* The curious behavior of the sea-lions in the Big lake, when they are *en route* and driven from Novastoshnah to the village, deserves mention. After the drove gets over the sand-dunes and beach between Webster's house and the extreme northeastern head of the lake, a halt is called and the drove "penned" on the bank there; then, when the sea-lions are well rested, they are started up, and pell-mell into the water; two natives, in a bidarka, keep them from turning out from shore into the broad bosom of Meesulkmahnee, while another bidarka paddles in their rear and follows their swift passage right down the eastern shore; in this method of procedure, the drive carries itself nearly two miles by water in less than twenty minutes from the time the sea-lions are first turned in, at the north end, to the moment when they are driven out at the southeastern elbow of the Big pond. The shallowness of the water here accounts probably for the strange failure of the sea-lions to regain their liberty, and so retards their swimming as to enable the bidarka, with two men, to keep abreast of their leaders easily, as they plunge ahead; and, "as one goes, so go all sheep," it is not necessary to pay attention to those which straggle behind in the wake; they are stirred up by the second bidarka, and none make the least attempt to diverge from the track which the swifter mark out in advance; if they did, they could escape "scot-free" in any one of the twenty minutes of this aquatic passage.

By consulting the map of St. Paul, it will be observed that in a direct line between the village and Northeast point there are quite a number of small lakes, including this large one of Meesulkmahnee; into all of these ponds the sea-lion drove is successively driven; this interposition of fresh water at such frequent intervals serves to shorten the time of the journey fully ten days in warmish weather, and at least four or five under the best of climatic conditions.

This track between Webster's house and the village killing-grounds is strewn with the bones of *Eumetopias*. They will drop in their tracks, now and then, even when carefully driven, from cerebral or spinal congestion principally; and when they are hurried the mortality *en route* is very great. The natives when driving them, keep them going day and night alike, but give them frequent resting spells after every spurt ahead. The old bulls flounder along for a hundred yards or so, then sullenly halt to regain breath, five or ten minutes being allowed them, then they are stirred up again, and so on, hour after hour, until the tedious transit is completed.

The younger sea-lions, and the cows which are in the drove, carry themselves easily far ahead of the bulls, and being thus always in the van, serve unconsciously to stimulate and coax the heavy males to travel. Otherwise, I do not believe that a band of old bulls, exclusively, could be driven down over this long road successfully.



THE SEA-LION PEN.

Natives corralling Sea-lions at the Barrabara near Webster's House, under Cross Hill, Northeast Point, St. Paul Island.

ARRIVAL OF THE DRIVE AT THE VILLAGE.—The procession of sea-lions managed in this strange manner day and night—for the natives never let up—is finally brought to rest within a stone's throw of the village, which has pleasurably anticipated, for days, and for weeks, its arrival, and rejoices in its appearance. The men get out their old rifles and large sea-lion lances, and sharpen their knives, while the women look well to their oil-pouches, and repair to the field of slaughter with meat-baskets on their heads.

MANNER IN WHICH THE KILLING IS CONDUCTED.—No attempt is made, even by the boldest Aleut, to destroy an old bull sea-lion by spearing the enraged and powerful beast, which, now familiar with man and conscious as it were of his puny strength, would seize the lance between its jaws and shake it from the hands of the stoutest one in a moment. Recourse is had to the rifle. The herd is started up the sloping flanks of the Black Bluff hill-side; the females speedily take the front, while the old males hang behind. Then the marksmen, walking up to within a few paces of each animal, deliberately draw their sights upon their heads and shoot them just between the eye and the ear. The old males thus destroyed, the cows and females are in turn surrounded by the natives, who, dropping their rifles, thrust the heavy iron lances into their trembling bodies at a point behind the fore-flippers, touching the heart with a single lunge. It is an unparalleled spectacle, dreadfully cruel and bloody.*

17. ECONOMIC USES OF THE SEA-LION.

HIGH APPRECIATION OF THE SEA-LION BY THE ALEUTS.—Although the sea-lion has little or no commercial value for us, yet to the service of the natives themselves, who live all along the Bering sea coast of Alaska, Kamtehatka, and the Kuriles, it is invaluable; they set great store by it. It supplies them with its hide, moustaches, flesh, fat, sinews, and intestines, which they make up into as many necessary garments, dishes, etc. They have abundant reason to treasure its skin highly, for it is the covering to their neat *bidaraks* and *bidaraks*, the former being the small *kyak* of Bering sea, while the latter is a boat of all work, exploration, and transportation. These skins are unhairied by sweating in a pile; then they are deftly sewed and carefully stretched over a light keel and frame of wood, making a perfectly water-tight boat that will stand, uninjured, the softening influence of water for a day or two at a time, if properly air-dried and oiled. After being used during the day, these skin boats are always drawn out on the beach, turned bottom-side up and air-dried during the night; in this way made ready for employment again on the morrow.†

VALUE OF THE INTESTINES.—A peculiar value is attached to the intestines of the sea-lion, which, after skinning, are distended with air and allowed to dry in that shape; then they are cut into ribbons and sewed strongly

* This surrounding of the cows, is, perhaps, the strangest procedure on the islands. To fully appreciate the subject, the reader must first call to his mind's eye the fact that these female sea-lions, though small beside the males, are yet large animals; seven and eight feet long, and weighing, each, as much as any four or five average men. But, in spite of their strength and agility, fifteen or twenty Aleuts, with a rough, iron-tipped lance in their hands, will surround a drove of 50 or 150 of them by forming a noisy, gesticulating circle, gradually closing up, man to man, until the sea-lions are literally piled in a writhing, squirming, struggling mass, one above the other, three or four deep, heads, flippers, bellies, backs all so woven and interwoven in this panic-stricken heap of terrified creatures, that it defies adequate description. The natives spear the cows on top, which, as they sink in death, are mounted in turn by the live animals underneath; these meet the deadly lance, in order, and so on until the whole herd is quiet and stilled in the fatal ebbing of their heart's blood.

† When slowly sketching, by measurements, the outlines of a fine adult bull sea-lion which the ball from Booter's rifle had just destroyed, an old "starooka" came up abruptly; not seeming to see me, she deliberately threw down a large, greasy, skin meat-bag, and whipping out a knife, went to work on my specimen. Curiosity prompted me to keep still in spite of the first sensations of annoyance, so that I might watch her choice and use of the animal's carcass. She first removed the skin, being actively aided in this operation by an uncouth boy; she then cut off the palms to both fore-flippers; the boy at the same time pulled out the moustache bristles; she then cut out its gullet, from the glottis to its junction with the stomach, carefully divested it of all fleshy attachments, and fat; she then cut out the stomach itself, and turned it inside out, carelessly scraping the gastric walls free of copious biliary secretions, the inevitable bunch of *ascaris*; she then told the boy to take hold of the duodenum end of the small intestine, and as he walked away with it she rapidly cleared it of its attachments, so that it was thus uncoiled to its full length of at least 60 feet; then she severed it, and then it was recoiled by the "melchiska", and laid up with the other members just removed, except the skin, which she had nothing more to do with. She then cut out the liver and ate several large pieces of that workhouse of the blood before dropping it into the meat-ponch. She then raked up several handfuls of the "leaf-lard", or lard, white fat that is found in moderate quantity around the viscera of all these pinnipeds, which she also dumped into the flesh-bag; she then drew her knife through the large heart, but did not touch it otherwise, looking at it intently, however, as it still quivered in unison with the warm flesh of the whole carcass. She and the boy then poked their fingers into the tumid lobes of the immense lungs, cutting out portions of them only, which were also put into the grimy pouch aforesaid; then she secured the gall-bladder and slipped it into a small yeast-powder tin, which was produced by the urchin; then she finished her economical dissection by cutting the sinews out of the back in unbroken bulk from the cervical vertebra to the sacrum; all these were stuffed into that skin bag, which she threw on her back and supported it by a band over her head; she then trudged back to the barrabkie from whence she sallied a short hour ago, like an old vulture to the slaughter; she made the following disposition of its contents: The palms were used to sole a pair of tarbosars, or native boots, of which, the uppers and knee tops were made of the gullets—one sea-lion gullet to each boot top; the stomach was carefully blown up, and left to dry on the barrabkie roof, eventually to be filled with oil rendered from sea-lion or fur-seal blubber. The small intestine was carefully injected with water and cleansed, then distended with air, and pegged out between two stakes, 60 feet apart, with little cross-slats here and there between to keep it clear of the ground. When it is thoroughly dry, it is ripped up in a straight line with its length and pressed out into a broad band of parchment gut, which she cuts up and uses in making a water-proof "kamlaikie", sewing it with those sinews taken from the back. The liver, leaf-lard, and lobes of the lungs were eaten without further cooking, and the little gall-bag was for some use in poulticing a scrofulous sore. The moustache-

together into that most characteristic water-proof garment of the world, known as the "kamlaika";* which, while being fully as water-proof as India rubber, has far greater strength, and is never affected by grease and oil. It is also transparent in its fitting over dark clothes. The sea-lions' throats are served in a similar manner, and, when cured, are made into boot tops, which are in turn soled by the tough skin that composes the palms of this animal's fore-flippers.

STOMACH-WALLS USED AS OIL-POUCHES.—Around the natives' houses, on St. Paul and St. George, constantly appear curious objects which, to the unaccustomed eye, resemble overgrown gourds or enormous calabashes with attenuated necks; an examination proves them to be the dried, distended stomach-walls of the sea-lion, filled with its oil; which, unlike the offensive blubber of the fur-seal, boils out clear and inodorous from its fat. The flesh of an old sea-lion, while not very palatable, is tasteless and dry; but the meat of a yearling is very much like veal, and when properly cooked I think it is just as good; but the superiority of the sea-lion meat over that of the fur-seal is decidedly marked. It requires some skill, in the *cuisine*, ere sausage and steaks of the *Callorhinus* are accepted on the table; while it does not, however, require much art, experience, or patience for the cook to serve up the juicy ribs of a young sea-lion so that the most fastidious palate will fail to relish it.

CARING FOR THE FLESH.—The carcass of the sea-lion, after it is stripped of its hide, and disemboweled, is hung up in cool weather by its hind-flippers, over a rude wooden frame or "labaas", as the natives call it, where, together with many more bodies of fur-seals treated in the same manner, it serves from November until the following season of May, as the meat-house of the Aleut on St. Paul and St. George. Exposed in this manner to the open weather, the natives keep their seal-meat almost any length of time, in winter, for use; and, like our old duck and bird hunters, they say they prefer to have the meat tainted rather than fresh, declaring that it is most tender and toothsome when decidedly "loud".

CHINESE DEMAND FOR WHISKERS.—The tough, elastic moustache bristles of the sea-lion are objects of great commercial activity by the Chinese, who prize them highly for pickers to their opium pipes, and several ceremonies peculiar to their joss houses. These lip bristles of the fur-seal are usually too small and too elastic for this service. The natives, however, always carefully pluck them out of the *Eumetopias*, and get their full value in exchange.

DIET OF THE SEA-LION.—The sea-lion also, as in the case of the fur-seal, is a fish-eater, pure and simple, though he, like the latter, occasionally varies his diet by consuming a limited amount of juicy sea-weed fronds, and tender marine crustaceans; but he hunts no animal whatever for food, nor does he ever molest, up here, the sea-fowl that incessantly hovers over his head, or sits in flocks without fear on the surface of the waters around him. He, like the *Callorhinus*, is, without question, a mighty fisherman, familiar with every submarine haunt of his piscatorial prey; and, like his cousin, rejects the heads of all those fish which have hard horny mouths, or are filled with teeth or bony plates.†

G. THE WALRUS OF BERING SEA (ODOBÆNUS OBESUS).

18. LIFE-HISTORY OF THE WALRUS.

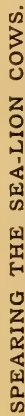
VOLUMINOUS WRITINGS RELATIVE TO THE WALRUS.—When I first set out for the seal-islands, from the Smithsonian Institution, in 1872, I fancied that, as far as the walrus was concerned, I should have nothing to learn, because of the literature on that subject which I had read, from the Congressional Library, viz:

The curious histories written by Olaus Magnus, in 1555; by Gesner, in 1558; by Martens, in 1675; by Pennant, in 1781-1792; by Buffon, in 1785; and by Cuvier, in 1816; together with an almost innumerable list of authors who have since contributed papers on the walrus and its character to nearly all the learned associations of the world.

bristles were a venture of the boy, who gathers all that he can, then sends them to San Francisco, where they find a ready sale to the Chinese, who pay about one cent apiece for them. When the natives cut up a sea-lion carcass, or one of a fur-seal, on the killing-grounds for meat, they take only the hams and the loins. Later in the season they eat the entire carcass, which they hang up by the hind-flippers on a "laabas" by their houses.

*The Aleutian name for this garment is unpronounceable in our language, and equally so in the more flexible Russian; hence the Alaskan "kamlaika," derived from the Siberian "kamläia." That is made of tanned reindeer skin, unhaired, and smoked by larch bark until it is colored a saffron yellow; and is worn over the reindeer skin undershirt, which has the hair next to the owner's skin, and the obverse side stained red by a decoction of alder bark. The kamläia is closed behind and before, and a hood, fastened to the back of the neck, is drawn over the head, when leaving shelter; so is the Aleutian kamlaika; only the one of Kolyma is used to keep out piercing dry cold, while the garment of the Bering sea is a perfect water repellent.

†Many authorities, who are quoted in regard to the habits of the hair-seals and southern sea-lions, speak with much fine detail of having witnessed the capture of sea-fowl by *Phocidæ* and *Otariidæ*. To this point of inquiry on the Pribylov islands, I gave continued close attention; because, off and around all of the rookeries large flocks of auks, arries, gulls, shags, and choochkies were swimming upon the water, and shifting thereupon incessantly, day and night, throughout the late spring, summer, and early fall. During the four seasons of my observation I never saw the slightest motion made by a fur-seal or sea-lion, a hair-seal, or a walrus toward intentionally disturbing a single bird, much less of capturing and eating it. Had these seals any appetite for sea-fowl, this craving could have been abundantly satisfied at the expense of absolutely no effort on their part. That none of these animals have any taste for water-birds I am thoroughly assured.



Natives bring the Sea-lion drove from Northeast Point. Shooting the old males.

With this imposing list of authorities in my mind, I thought I had reason to believe that there was nothing about this pinniped which I should find new, or even interesting to science.

THE WALRUS OF BERING SEA.—When, therefore, looking for the first time upon the walrus of Bering sea, judge of my astonishment as I beheld the animal before me. It was a new species; it was a new creature, or all that had been written by five hundred authors in regard to the appearance and behavior of its Atlantic cousin was in error. The natives who accompanied me were hurriedly summoned to my side, called from their eager task of picking up birds' eggs. "Are these walrus sick?" said I. They looked at me in astonishment; "No, they are not." "Do they always look like that?" "Serovnah,"* was the answer.

Such was my introduction to *Rosmarus arcticus* (Pallas), and the occasion of my describing it in 1873, for the first time, as the walrus of Bering sea—a distinct and separate animal, specifically, from its congener of the North Atlantic. *Odobenus rosmarus* (Allen).†

WALRUS ON THE PRIBYLOV ISLANDS.—In early days, when the Pribylov islands were first occupied by the Russians, report has it that large numbers of these creatures frequented the entire coast line of St. Paul island, and many were found around St. George; but, being relatively more timid than the sea-lion in respect to the presence of man, they rapidly disappeared as he took possession of the land; the disappearance, however, was not total—a few of them every year were and can now be observed upon that little rocky islet, lying six miles to the southeast of the Northeast point of St. Paul island, owing to its comparative isolation; since the natives only go there once a year, and then only for a few days during the egg season.‡

SELECTION OF LANDINGS BY WALRUS HERDS.—The walrus rests upon the low rocky tables characteristic of this place, without being disturbed; hence the locality afforded me a particularly pleasant and advantageous opportunity of minutely observing these animals. My observations, perhaps, would not have passed over a few moments of general notice, had I found the picture presented by them such as I had drawn in my mind from the descriptions of the army of writers cited above; the contrary, however, stamping itself so suddenly and decidedly upon my eye, set me to work with pen and brush in noting and portraying the extraordinary brutes, as they lay grunting and bellowing, unconscious of my presence, and not ten feet from the ledge upon which I sat.§

LIFE-STUDIES OF THE HERD.—Sitting as I did to the leeward of them, a strong wind blowing at the time from seaward, which, ever and anon, fairly covered many of them with the foaming surf-spray, they took no notice of me during the three or more hours of my study. I was first surprised at observing the raw, naked appearance of the

* Just the same.

† Allen, in reviewing the history of this species, cites the hesitating opinions of Pennant, in 1792; of Shaw, in 1800; of F. Cuvier, in 1825; of Leidy, in 1860, all of whom suggest the specific distinctness of the Bering sea walrus, but give their ideas clouded by expressed hints or mental reservations. He shows, however, that Illiger, in 1811, formally recognized three varieties, but that this author gives nowhere his reasons for so doing; he named them *Trichechus rosmarus* for the North Atlantic, and *T. obesus* and *T. divergens* for the Bering sea region and waters north of the straits thereof. Then Allen says, page 21, "I have met with nothing further touching this subject prior to Mr. H. W. Elliott's report on the seal-islands of Alaska, published in 1873, and he quotes it freely. Professor Allen has, however, done the osteological part of the work so well in his *History of North American Pinnipeds*, that now I deem it finished.

While Allen agrees with me finally in my early determination of the Bering sea walrus as a distinct species from that of the Atlantic, he seems to base all of his belief upon the osteological differentiation between them. I have had my faith in that one line of evidence as to genera and species, so sadly shaken by the amazing asymmetry and differences in the skulls and skeletons of the fur-seal which are bleaching out here side by side, thousands and tens of thousands of them, that I feel better satisfied with the characteristic external features of the pinnipeds, which are really more fixed and exact among the hundreds of thousands on the Pribylov islands. Perhaps ten thousand skulls of *Odobenus obesus* would show a great number of examples which could not, alone by themselves, be separated from types of *O. rosmarus*. From my inspection of the wide range of variation presented in a large series of *Callorhinus* and *Eumetopias* skulls, I do not have any hesitation in saying so.

‡ As to the number of walrus on the Pribylov islands in prehistoric time, and when the Russians first took possession of the same, 1786-1787, I have not been able to find any record of the least authentic value. Beyond the general legend of the natives that in olden times the "morsjee" were wont to haul in considerable number at Novoshtoslnah and over the entire extent of the north and south shores of St. Paul, while herds were also common under the precipitous sea-walls of St. George. Gavril Sarietschev, one of the several imperial agents commissioned at intervals to examine into the affairs of the old Russian American Fur Company, in the details of his report made in December, 1805, incidentally states, speaking of the walrus, that while they had abandoned the Pribylov islands then, yet, formerly they were there in such numbers that 28,000 pounds of their teeth (tusks) were obtained in a single year; as the average weight of well assorted walrus ivory is about 8 pounds to the head, of each animal, this memorandum of the agent shows that between 3,500 and 4,000 walrus were taken. From the quantity of old bones of *Rosmarus* which are constantly covered and uncovered by the caprice of the wind at Nalsayverniah and Novostoslnah, I should judge the Russian officer was correct.

§ These favored basaltic tables are also commented upon in similar connection by an old writer in 1775, Shuldham, who calls them "echouries"; he is describing the Atlantic walrus as it appears at the Magdalen islands: "The echouries are formed principally by nature, being a gradual slope of soft rock, with which the Magdalen islands abound, about 60 to 100 yards wide at the water side, and spreading so as to contain, near the summit, a very considerable number." The tables at Walrus island and those at Southwest point, are very much less in area than those described by Shuldham, and are a small series of low, saw-tooth jetties of the harder basalt washed in relief, from a tufa matrix; there is no room to the landward of them for many walruses to lie upon. The *Odobenus* does not like to haul up on loose or shingly shores, because it has the greatest difficulty in getting a solid hold for its fore-flippers with which to pry up and ahead its huge, clumsy body. When it hauls on a sand beach, it never attempts to crawl out to the dry region back of the surf, but lies just awash, at high water. In this fashion they used to rest all along the sand reaches of St. Paul prior to the Russian advent in 1786-1787; and when Shuldham was inditing his letters on the habits of *Rosmarus*, *Odobenus* was then lying out in full force and great physical peace on the Pribylov islands.

hide, a skin covered with a multitude of pustular looking warts and large boils or pimples, without hair or fur, save scattered and almost invisible hairs; the skin wrinkled in deep, flabby seam-folds, and marked by dark-red venous lines, which showed out in strong contrast through the thicker and thinner yellowish-brown cuticle, that in turn seemed to be scaling off in places as if with leprosy; indeed, a fair expression of this walrus-hide complexion, if I may use the term, can be understood by the inspection of those human countenances in the streets and on the highways of our cities which are designated as the faces of "bloats". The forms of *Rosmarus* struck my eye at first in the most unpleasant manner, and the longer I looked at them the more heightened was my disgust; for they resembled distorted, mortified, shapeless masses of flesh; the clusters of swollen watery pimples, which were of yellow parboiled flesh-color, and principally located over the shoulders, and around the necks, painfully suggested unwholesomeness.

On examining the herd individually, and looking over perhaps 150 specimens directly beneath and within the purview of my observation, I noticed that there were no females among them; they were all males, and some of the younger ones had considerable hair, or enough of that close, short, brown coat to give a hairy tone to their bodies—hence I believe that it is only the old, wholly matured males which offered to my eyes their bare and loathsome nakedness.

I observed, as they swam around, and before they landed, that they were clumsy in the water, not being able to swim at all like the *Phocidæ* and the *Otaridæ*; but their progress in the sea was wonderfully alert when brought into comparison with that terrestrial action of theirs; the immense bulk and weight of this walrus contrasted with the size and strength of its limbs, renders it simply impotent when hauled out of the water, and on the low rocky beaches or shelves upon which it rests. Like the seal, however, it swims entirely under water when traveling, but it does not rise, in my opinion, so frequently to take breath; when it does, it blows or snorts not unlike a whale. Often I have noticed this puffing snort of these animals, since the date of these observations on Walrus islet, when standing on the bluffs near the village of St. Paul and looking seaward; on one cool, quiet morning in May especially, I followed with my eye a herd of walrus, tracing its progress some distance off and up along the east coast of the island very easily by the tiny jets of moisture or vapor from the confined breath, which the animals blew off as they rose to respire.*

METHODS OF LANDING: CLUMSY EFFORTS.—In landing and climbing over the low, rocky shores at Morserovia,† this animal is fairly as clumsy and almost as indolent as the sloth. A herd crowds up from the water, one after the other, in the most ungainly manner, accompanying their movements with low grunts and bellowings; the

* Mariners, while coasting in the Arctic, have often been put on timely footing by the walrus fog-horn snorting and blowing when a ship dangerously sails silently in through dense fog toward land or ice-floes, upon which these animals may be resting; indeed, these uncouth monitors to this indistinct danger rise and bob under and around a vessel like so many gnomes or demons of fairy romance; and the sailors may well be pardoned for much of the strange yarns which they have given to the reading world respecting the sea-horse, during the last three centuries; but when we find Albert Magnus, and Gesner the sage, talking in the following extraordinary manner of the capture of *Rosmarus*, we are constrained to laugh heartily; especially do we so, because a more shy, timid brute than the walrus of Bering sea never existed when he is hunted by man, unless it be the sea-otter.

Says Gesner in 1558: "Therefore these fish called *Rosmarii* or *Morsii*, have heads fashioned like to an ox, and a hairy skin, and hair growing as thick as straw or corn-reeds, that lie loose very largely. They will raise themselves with their teeth, as by ladders, to the very tops of rocks that they may feed upon the dewie grasse, or fresh water, and role themselves in it, and then go to the sea again, unless in the mean time they fall very fast asleep, and rest upon the rocks, for then the fishermen make all the haste they can and begin at the tail, and part the skin from the fat; and into this that is parted they put most strong cords, and fasten them on the rugged rocks or trees that are near; and then they throw stones at his head, out of a sling, to raise him, and they compel him to descend spoiled of the greatest part of his skin which is fastened to the ropes; he being thereby debilitated, fearful and half dead, he is made a rich prey, especially for his teeth, that are very pretious amongst the *Scythians*, the *Muscovites*, *Russians* and *Tartars* (as ivory amongst the *Indians*) by reason of its hardness, whiteness and ponderousness".

In spite of the many remarkable and well authenticated stories printed as to the ferocity of the Atlantic walrus when hunted, it can be safely said that no boat has ever been assailed by the Alaskan species, which is as large if not larger, and in every respect quite as able-bodied; the Eskimo capture them without danger or difficulty—mere child's play or woman's work—spearing and lancing. By spearing, a line of walrus hide is made fast to the plethoric body of *Rosmarus*, and when it has expended its surplus vitality by toying the natives a few miles in a mad frenzied burst of swimming, the bidarra is quietly drawn up to its puffing form, close enough to permit the coup of an ivory-headed lance, then towed to the beach at high water; when the ebb is well out, the huge carcass is skinned by its dusky butchers, who cut it up into large square chunks of flesh and blubber, which are deposited in the little "Dutch-oven" caches of each family that are waiting for its reception.

Dressing the walrus hides is the only serious hard labor which the Alaskan Inuit subjects himself to; he cannot lay it entirely upon the women, as do the Sioux when they spread buffalo bodies all over the plains; it is too much for female strength alone, and so the men bear a hand right lustily in the business. It takes from four to six stout natives, when a green walrus hide is removed, to carry it to the sweating hole where it is speedily unhaird; then stretched alternately upon air-frames and pinned over the earth, it is gradually scraped down to the requisite thinness for use in covering the bidarra skeletons, etc.

There are probably six or seven thousand human beings in Alaska who live alone by virtue of the existence of *Rosmarus*; and, every year, when the season opens, they gather together by settlements, as they are contiguous, and discuss the walrus chances for the coming year as earnestly and as wisely as our farmers do, for instance, regarding the prospects for corn and potatoes. But the Eskimo hunter is a sadly improvident mortal, though he is not wasteful of morse life; while we are provident, and yet wasteful of our resources.

If the north pole is ever reached by our people, they will do so only when they can eat walrus meat, and get plenty of it; at least that is my belief; and knowing now what the diet is, I think the journey to the hyperborean ultima is a long one, though there is plenty of meat, and many men who want to try it.

† *Morserovia*, the Russian name for Walrus island; the natives also call Otter island by the Russian title of *Bobrovia*.



THE WALRUS OF BERING SEA.

(*Rosmarus arcticus*.)

A life-study of an old male by the author: Walrus Island, July 5, 1872.

first one up from the sea no sooner gets composed upon the rocks for sleep, than the second one comes along, prodding and poking with its blunted tusks, demanding room also, and causes the first to change its position to another location still farther off and up from the water, a few feet beyond; then the second is in turn treated in the same way by a third, and so on until hundreds will be slowly packed together on the shore, as thickly as they can lie, never far back from the surf; however, pillowing their heads upon the bodies of one another, and not acting at all quarrelsome toward each other. Occasionally, in their lazy, phlegmatic adjusting and crowding, the posteriors of some old bull will be lifted up, and remain elevated in the air, while the passive owner sleeps with its head, perhaps, beneath the pudgy form of its neighbor.

USE OF TUSKS.—A great deal has been written in regard to the manner in which the walrus uses his enormous canines; many authors have it that they are employed by *Rosmarus* as landing hooks, so that by sticking them into the icy floes, or inserting them between rocky interstices or inequalities, the clumsy brute aids his hauling out from the sea. I looked here at Walrus island very closely for such manifestation of their service to the members of the herd, which was continually augmented by fresh arrivals from the surf while under my eye. They did not in a single instance use their tusks in this manner; it was all done by the fore-flippers, and "boosting" of exceptionally heavy surf which rolled in at wide intervals, and for which marine assistance the walrus themselves seemed to patiently wait.*

With all this apparent indifference, however, they have established their reputation for vigilance in spite of it; and they resort to a very singular method of keeping guard, if I may so term it. In this herd of three or four hundred male walrus that were under my eyes, though nearly all were sleeping, yet the movement of one would disturb the other, which would raise its head in a stupid manner, for a few moments, grunt once or twice, and before lying down to sleep again, it would strike the slumbering form of its nearest companion with its tusks, causing that animal to rouse up in turn for a few moments also, grunt, and pass the blow on to the next, lying down in the same manner. Thus the word was transferred, as it were, constantly and unceasingly around, always keeping some one or two aroused, which consequently were more alert than the rest.

HELPLESSNESS ON LAND.—In moving on land they do not seem to have any physical power in the hind limbs; these are usually dragged and twitched up behind, or feebly flattened out at right angles to the body; terrestrial progression is slowly and tediously made by a dragging succession of short steps forward on the fore-feet; but, if the alarm is given, it is astonishing to note the contrast which they present in their method of getting back to sea; they fairly roll and hustle themselves over and into the waves.

How long they remain out from the water, in this country, I am unable to say; but, stored up as they are with such an enormous supply of surplus fat, dull and sluggish in temperament, I should think that they could sustain a fasting period equal to that of the *Otariidæ*, if not superior to them in endurance.

These adult males before me looked very much larger than I expected to find the walrus,† and it was fortunate

* I have seen no description of this Pacific walrus which is as good as the first notice of it ever made to English readers, by Captain Cook, in his *Last Voyage*; it is, as far as it goes, precisely in accordance with my views of the same animal, nearly a century later, viz, July, 1872. He said: "They lie in herds of many hundreds upon the ice, huddling one over the other like swine, and roar or bay very loud, so that in the night, or in foggy weather, they gave us notice of the vicinity of the ice before we could see it. We never found the whole herd asleep; some being always on the watch. These, on the approach of the boat, would wake those next to them, and the alarm being thus gradually communicated, the whole herd would be awake presently. But they were seldom in a hurry to get away till after they had once been fired at, when they would tumble one over the other into the sea in the utmost confusion, and if we did not at the first discharge kill those we fired at, we generally lost them, though mortally wounded. They did not appear to be that dangerous animal some authors have described, not even when attacked. They are rather more so to appearance than in reality. Vast numbers of them would follow, and some come close up to the boats; but the flash of a musket in the pan, or even the bare pointing of one at them, would send them down in an instant. The female will defend the young one to the very last, and at the expense of her own life, whether in the water or upon the ice. Nor will the young one quit the dam though she be dead; so that, if you kill one you are sure of the other. The dam, when in the water, holds the young one between her fore-fins." [Cook's (1778) *Voyages to the Pacific Ocean*, etc., vol. ii, p. 458. London, 1785.]

I do not wish to appear in the light of desiring to detract one iota from that credit of accurate description which so justly belongs to Cook; but he himself did not indicate that he thought the Pacific walrus a distinct species from its Atlantic congener; his figure of the Bering sea *Rosmarus* is entirely grotesque; a human face with beard, a thin neck and immensely inflated posteriors, and fore-dippers divided up into distinct fingers, make a creature as totally unlike *Odobanus obesus* as need be; yet, naturalists have gravely spoken of it as "excellent"! Had Captain Cook possessed the same explicit and graphic power of description in his pencil that characterizes his pen, I know full well that this caricature above referred to [Cook's *Voyage to the Pacific Ocean*, etc., 1776-1780, vol. ii, pl. lii] would never have appeared.

The pinnipeds are, perhaps, of all animals, the most difficult subjects that the artist can find to reproduce from life; there are no angles or elbows to seize hold of—the lines of body and limbs are all rounded, free and flowing; yet the very fleshiest examples never have that bloated, wind-distended look which most of the figures published give them. One must first become familiarized with the restless, varying attitudes of these creatures, by extended personal contact and observation, ere he can satisfy himself with the result of his drawings, no matter how expert he may be in rapid and artistic delineation. Life-studies, by artists, of the young of the Atlantic walrus have been made in several instances, but of the mature animal, there is nothing extant of that character.

† The most satisfactory result that I can obtain from a careful study of what is on record as to the length of the adult ♂ Atlantic walrus is a mean of 10 feet 7 inches; while my observations on Walrus island give the Bering sea ♂ adult walrus an average of 11 feet; the only two examples which I measured were both over this figure, viz, 11 feet 9 inches, and 12 feet 7 inches, from tip of muzzle to the skinny nodule or excrescence, scientifically known as the tail; but they were striking exceptions in superior size to all the others in the large herd of old males before my eyes at the time, and were singled out for shooting on that score. I fully realize this, because in July,

for the accuracy and good sense of these notes now published, that one of the natives kindly volunteered to shoot any of the bulls, of which I might select, after I should have finished my sketching and writing. I therefore, when my drawings were completed, selected the largest animal in the group; and, promptly at my signal, a rifle ball crashed into the skull at the only place where it could enter, just on the line of the eye and the ear, midway between them.

GREAT SIZE OF THE WALRUS.—This animal, thus slain, certainly was the largest one of the entire herd, and the following measurements and notes can, therefore, be relied upon: it measured 12 feet 7 inches from its bluff nostrils to the tip of its excessively abbreviated tail, which was not more than $2\frac{1}{2}$ or 3 inches long; it had the surprising girth of 14 feet. The immense mass of blubber on the shoulders and around the neck made the head look strangely small in proportion, and the posteriors decidedly attenuated; indeed, the whole weight of the animal was bound up in its girth anteriorly; it was a physical impossibility for me to weigh this brute, and I therefore can do nothing but make a guess, having this fact to guide me: that the head end directly off at the junction with the spine, or the occipital or atlas joint, weighed 80 pounds; that the skin, which I carefully removed with the aid of these natives, with the head, weighed 570 pounds. Deducting the head, and excluding the flippers, I think it is safe to say that the skin itself would not weigh less than 350 pounds, and the animal could not weigh much less than a ton—from 2,000 to 2,200 pounds.

CHARACTERS OF HEAD.—The head has a decided flattened appearance, for the nostrils, eyes, and ear-spots seem to be placed nearly on top of the cranium; the nasal apertures are literally so, opening directly over the muzzle; they are oval, and closed parallel with the longitudinal axis of the skull, and when dilated are about an inch in their greatest diameter.

The tusks, or canines, are set firmly under the nostril-apertures in deep, massive, bony pockets, giving that strange, broad, square-cut front of the muzzle, so characteristic to the physiognomy.

The upper lips of the walrus of Bering sea are exceedingly thick and gristly, and the bluff, square muzzle is studded, in regular rows and intervals, with a hundred or so short, stubby, gray-white bristles, varying in length from one half to three inches. There are a few very short and much softer bristles set, also, on the fairly hidden chin of the lower jaw, which closes up under the projecting snout and muzzle, and is nearly concealed by the enormous tushes, when laterally viewed.

PECULIARITIES OF THE EYES.—The eyes are small, but prominent; placed nearly on top of the head, and protruding from their sockets, bulge like those of the lobster. The iris and pupil of this eye is less than one-fourth of the exposed surface; the sclerotic coat swells out from under the lids when they are opened, and is of a dirty, mottled, coffee-yellow and brown, with an occasional admixture of white; the iris itself is light brown, with dark brown rays and spots. I noticed that whenever the animal roused itself, instead of turning its head, it rolled its eyes about, seldom moving the cranium more than to elevate it. The eyes seem to move, rotating in every direction when the creature is startled, giving the face of this monster a very extraordinary attraction, especially when studied by an artist. The expression is just indescribable. The range of sight enjoyed by the walrus out of water, I can testify, is not well developed; for, after throwing small chips of rock down upon the walruses near me, several of them not being ten feet distant, and causing them only to stupidly stare and give vent to low grunts of astonishment, I then rose gently and silently to my feet, standing boldly up before them; but then, even, I was not noticed, though their eyes rolled all over from above to under me. Had I, however, made a little noise, or had I been standing as far as 1,000 yards away from them to the windward, they would have taken the alarm instantly and tumbled off into the sea like so many hustled wool-sacks; for their sense of smell is of the keen, keenest.

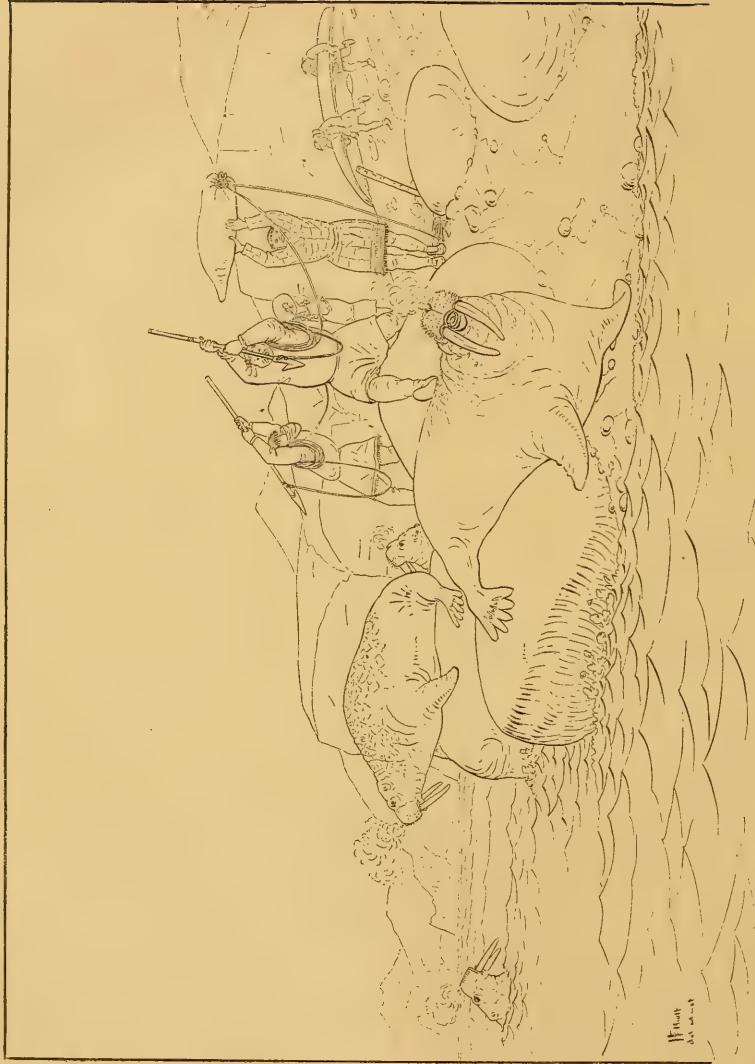
ACUTE HEARING.—The ears of the walrus, or rather the auricles to the ears, are on the same lateral line at the top of the head with the nostrils and eyes, the latter being just midway between. The pavilion, or auricle, is a mere fleshy wrinkle or fold, not at all raised or developed; and, from what I could see of the *meatus externus*, it was very narrow and small; still, the natives assured me that the *Otariidæ* had no better organs of hearing than "Morsjee".

LOOSE SETTING OF THE TUSKS.—The head of the male walrus, to which I have alluded, and from which I afterward removed the skin, was 18 inches long between the nostrils and the post-occipital region; and, although the enormous tusks seemed to be so firmly planted in their osseous sockets, judge of my astonishment when one of the younger natives flippantly struck a tusk with a wooden club quite smartly, and then easily jerked the tooth forth. I had frequently observed that it was difficult to keep the teeth from rattling out of their alveoli in any of the best skulls I had gathered of the fur-seals and sea-lions; especially difficult in the case of the latter. But again, on this interesting subject of dentition, it is best that I refer to Dr. Allen. Repetition of his admirable diagnosis is unnecessary here.

UNUSUAL THICKNESS OF THE SKIN.—The thickness of the hide* of the walrus is, after all, in my opinion, its

1874, when I revisited Walrus island, I caused a younger male, and one tolerably well haired over with a very dark brown and short coat, to be shot; when measured it gave a length of only 10 feet 9 inches, and would not weigh, in my best estimation, more than 1,200 to 1,500 pounds. It was, however, fully matured. Thus the "greater size" which I recognized in 1872, means an increased length of five or six inches to the Alaska form, with a relative greater *avoirduois*. The complete and uniform unhairing of the old Alaskan male *Odobanus*, is another very characteristic feature in different expression from Atlantic herds.

* While savage man has utilized the tough hide of *Rosmarus* and *Obeus*, the skin was also used by the Russians themselves to cover the packages of furs sent from Sitka to Kiachta, China; the skin was there stripped and again sewed anew over the chests of tea that were



PLUNGING THE HARPOON.

Innuits of St. Lawrence Island, Alaska, making fast to Walruses surprised by the Eskimo while hauled up on the sea-beaches at Kagallegak.

most anomalous feature. I remember well how surprised I was when I followed the incision of the broad-axe used in beheading the specimen shot for my benefit, to find that the skin over the shoulders and around the throat and chest was three inches thick—a puffy, spongy epidermis, outward hateful to the sight, and inwardly resting upon the slightly aerid fat or blubber so characteristic of this animal. Nowhere is this hide, upon the thinnest point of measurement, less than half an inch thick. It feeds exclusively upon shellfish (*Lamellibranchiata*), or clams principally, and also upon the bulbous roots and tender stalks of certain marine plants and grasses which grow in great abundance over the bottoms of broad, shallow lagoons and bays of the main Alaskan coast. I took from the paunch of the walrus above mentioned, more than a bushel of crushed clams in their shells, all of which that animal had evidently just swallowed, for digestion had scarcely commenced. Many of those clams in that stomach, large as my clenched hands, were not even broken; and it is in digging this shellfish food that the services rendered by the enormous tusks become apparent.*

COWARDICE OF THE WALRUS OF BERING SEA.—It may not accord with the singular tales told, on the Atlantic side, about the uses of these gleaming ivory teeth, so famous and conspicuous; but I believe that the Alaskan walrus employs them solely in the labor of digging clams and rooting bulbs from those muddy ooze and sand-bars in the estuary waters peculiar to his geographical distribution. Certainly, it is difficult for me to reconcile the idea of such uncouth, timid brutes, as were those spread before me on Walrus islet, with any of the strange chapters written as to the ferocity and devilish courage of the Greenland morse. These animals were exceeding cowardly; abjectly so. It is with the greatest difficulty that the natives, when a herd of walruses are surprised, can get a second shot at them; so far from clustering attacks around their boats, it is the very reverse; and the hunter's only solicitude is which way to travel in order that he may come up with the fleeing animals as they rise to breathe. Again, I visited Walrus islet in 1874, accompanied by Lieutenant Maynard, United States navy, and the captain of the revenue-cutter *Reliance*. We rowed from the ship directly toward the islet, to a point where we saw the accustomed and expected sight of walrus lying thereon. The wind was fair for us and we came up almost to within a boat's oar distance of the dozing, phlegmatic herd. One was singled out, and Captain Baker shot it—his first walrus; the whole herd, as usual, hustled with terrible energy into the water, and all around our boat, for we had not landed, and they did not rise about or near us to give one snort of defiance, or to give us the faintest suggestion of any disposition to attack us, but they disappeared unpleasantly soon—too quickly.

ABSENCE OF FEMALES ON WALRUS ISLAND.—As I have said before, there are no females on this island, and I can therefore say nothing about them; I regret it exceedingly. On questioning the natives, as we returned, they told me that the walrus of Bering sea was monogamous; and that the difference between the sexes in size, color, and shape is inconsiderable; or, in other words, that until the males are old, the young males and the females of all ages are not remarkably distinct, and would not be at all if it were not for the teeth; they said that the female brings forth her young, a single calf, in June, usually, on the ice-floes in the Arctic ocean, above Bering straits, between point Barrow and cape Seartze Kaummin; that this calf resembles the parent in general proportions and color when it is hardly over six weeks old, but that the tusks (which give it its most distinguishing expression) are not visible until the second year of its life; that the walrus mother is strongly attached to her offspring, and nurses it later through the season in the sea; that the walrus sleeps profoundly in

received in exchange for these furs thus enveloped, and which were carried hence to Moscow. Here the soundest portions of the hide remaining on the boxes were finally cut up and stamped into "kopecks" and a variety of small change, in time, to revisit its native seas; used as a circulating medium, for value received, throughout all Alaska where the Russians held power. A leather currency was long known to that country, and old Philip Volkov, of St. Paul, told me that he never saw silver or gold coin used on the seal-islands until our people brought it in 1868. These walrus parchment roubles were worth much less than their face value—sometimes only one-third. The Russians also made harness out of walrus leather. As long as the weather remained cold and dry the wear of this material was highly satisfactory, but woe to the "kibitche" if caught out in a rain storm! The walrus harness then stretches like india-rubber, and the horses fairly leave the vehicle far behind, sticking in the road, though the traces are unbroken.

*It is, and always will be, a source of sincere regret to me and my friends, that I did not bodily preserve this huge paunch and its contents. It would have filled a half barrel very snugly, and then its mass of freshly swallowed clams (*Mya truncata*), filmy streaks of macerated kelp, and fragments of crustaceans, could have been carefully examined during a week of leisure at the Smithsonian Institution. It was, however, ripped open so quickly by one of the Alents, who kicked the contents out, that I hardly knew what had been done, ere the strong-smelling subject was directly under my nose. The natives then were anxious that I should hurry through with my sketches, measurements, etc., so that they might the sooner push off their egg-laden bidarrahs and cross back to the main island, before the fogs would settle over our homeward track, or the rapidly rising wind shift to the northward and imperil our passage. Weighty reasons, these, which so fully impressed me, that this unique stomach of a *carnivora* was overlooked and left behind; hence, with the exception of curiously turning over the clams (especially those uncrushed specimens), which formed the great bulk of its contents, I have no memoranda or even distinct recollection of the other materials that were incorporated. The olivaceous green color of its soft, pasty excrement must be derived from eating *chlorosperme* and divers branches of algoid growth.

†That the sea-lion and the fur-seal should be so apathetic when danger to their young arises, and that the clumsy, timid walrus fights for their protection to the death, under the same circumstances, is somewhat strange. According to all reports which I can gather from reputable authority, notably Captain Cook's brief, yet explicit, account, the walrus never deserts its young in that manner, hitherto described, so characteristic of the *Otaridae* of Bering sea; this odd contrast in behavior is worthy of further attention, as far as

the water, floating almost vertically, with barely more than the nostrils above water, and can be easily approached if care is taken as to the wind, so as to spear it or shove a lance into its bowels; that the bulls do not fight as savagely as the fur-seal or the sea-lion; that the blunted tusks of these combatants seldom do more than bruise their thick hides; that they can remain under water nearly an hour, or about twice as long as the seals; and that they sink like so many stones, immediately after being shot at sea.*

FIRST RECORD OF THE OCCURRENCE OF FEMALES.—The reason why this band of males, and many of them old ones, should be here to the exclusion of females throughout the year, is not plain. The natives assured me that walrus females, or their young, never have been seen around the shores of these islands; but I have trustworthy advices from the village of St. Paul, at the date of this publication, declaring the fact of the capture of a female on Walrus islet last fall, the first one ever recorded.

GEOGRAPHICAL DISTRIBUTION OF THE WALRUS OF ALASKA.—The walrus has, however, a very wide range of distribution in Alaska, though not near so great as in prehistoric times.† They abound to the eastward and southeastward of St. Paul, over in Bristol bay, where great numbers congregate on the sand-bars and flats, now flooded, now bared by the rising and ebbing of the tide. They are hunted here to a considerable extent for their ivory; no walrus are found south of the Aleutian islands; still, not more than forty-five or fifty years ago, small gatherings of these animals were killed here and there on the islands between Kadiak and Oonimak pass; the greatest aggregate of them, south of Bering straits, will always be found in the estuaries of Bristol bay and on the north side of the peninsula.

PREHISTORIC RANGE OF THE WALRUS.—Geologists find the record of the great ice period well filled up by the range of the walrus, then, as far down on the Atlantic coast as the littoral margins of South and North Carolina; and its fossil remains are common in the diluvial deposits of England and France, while the phosphate beds of New Jersey are exceedingly rich in old walrus bones; but, within historic times, there is no evidence that points to the existence of the walrus on the New England coast. During the last half of the sixteenth century they are known to have frequented the southern confines of Nova Scotia. That hardy navigator, James Cartier, tells us, in his quaint vernacular, that in May, 1534, he met at the island of "Ramea" (probably Sable island), sporting in the sea, "very great beastes, as greate as oxen, which have two greate teeth in their mouths like unto Elephant's teeth, & live also in the Sea. We saw them sleeping on the banke of the water; wee, thinking to take it, went with our boates, but so soon as he heard us he caste himselfe into the sea". Another old salt, "Thomas James, of Bristol," speaking of the same subject shortly after, says, "the fish cometh on banke (to do their kind) in April, May, and June, by numbers of thousands, which fish is very big, and hath two great teeth; and the skin of them is like Beeffies leather; and they will not away from their yong ones. The yong ones are as good meat as Veale. And with the bellies of five of the saide fishes they make a hogshhead of Traine, which Traine is very sweet, which,

the walrus is concerned. There were no females or young among the herds of *Rosmarus* which I observed at Walrus island; hence, I am unable myself to give any facts based upon life-studies.

The reported affection and devotion of the mother walrus seems only natural, being, as it is, the rule throughout all the higher grades of mammalia; while this attitude of the sea-lion and fur-seal is decidedly opposed to it; and, were it not that it was so plainly presented in a thousand and one cases to my senses, I should have seriously doubted its correctness. Still, the best authority that I can recognize on the habits of the *Phocida*, Kumlein, says that the hair-seals all display the same indifference which I portray in this respect as characteristic of the fur-seal and sea-lion.—[Kumlein: *Contributions to the Natural History of Arctic America*. Bull. U. S. National Museum: Washington, p. 59, 1879.]

* I personally made no experiments touching the peculiarity of sinking immediately after being shot; of course, on reflection, it will appear to any mind that all seals, no matter how fat or how lean, would sink instantly out of sight, if not killed at the stroke of the bullet; even if mortally wounded, the great involuntary impulse of brain and muscle would be to dive and speed away; for all swimming is submarine when the pinnipeds desire to travel.

Touching this mooted question, I had an opportunity when in Port Townsend, during 1874, to ask a man who had served as a partner in a fur-sealing schooner off the straits of Fuca. He told me that unless the seal was instantly killed by the passage of the rifle bullet through its brain, it was never secured, and would sink before they could reach the bubbling wake of its disappearance; if, however the aim of the marksman had been correct, then the body was invariably taken within five to ten minutes after the shooting. Only one man did the shooting; all the rest of the crew, 10 to 12 white men and Indians, manned canoes and boats which were promptly dispatched from the schooner, after each report, in the direction of the shooting. How long one of the bodies of these "clean" killed seals would float, he did not know; the practice always was to get it as quickly as possible, fearing that the bearings of its position, when shot from the schooner, might be confused or lost; he also affirmed that, in his opinion, there were not a dozen men on the whole northwest coast who were good enough with a rifle, and expert at distance calculation, to shoot fur-seals successfully from the deck of a vessel on the ocean. The Indians of Cape Flattery get most of the pelagic fur-seals by cautiously approaching from the leeward when they are asleep, and throwing line darts or harpoons into them before they awaken.

† I have been frequently questioned whether, in my opinion, it was more than a short space of time ere the walrus was exterminated or not, since the whalers had begun to hunt them in Bering sea and the Arctic ocean. To this I frankly make answer, that I do not know enough of the subject to give correct judgment. The walrus spend most of their time in waters that are within reach of these skillful and hardy navigators; and if they (the walrus) are of sufficient value to the whaler, he can, and undoubtedly will, make a business of killing them, and work the same sad result that he has brought about with the mighty schools of cetacea, which once whistled and bared their backs throughout the now deserted waters of Bering sea in perfect peace and seclusion prior to 1842. The returns of the old Russian America Company show that an annual average of 10,000 walrus have been slain by the Eskimo since 1799 up to 1867. There are a great many left yet. But unless the oil of *Rosmarus* becomes very precious, commercially, I think the shoal waters of Bristol bay and Kuskokwim mouth, together with the eccentric tides thereof, will preserve it indefinitely. Forty years ago, when the North Pacific was the rendezvous of



THE DEATH-STROKE OF THE WALRUS.

Eskimo lancing the exhausted Walrus, St. Lawrence Island.

Mahlemoot dress, bidarka, baldar, etc., of Alaska.

if it will make sope, the King of Spaine may burne some of his Olive trees." (1) This spice of Yankee enterprise in "sope", evidently, did not come to a successful head.*

THE WALRUS "BIDARRAH".—The finest bidarrah skin-boats of transportation that I have seen in this country, were those of the St. Lawrence natives; these were made out of dressed walrus hides, shaved and pared down by them to the requisite thickness, so that when they were sewed with sinews to the wooden whalebone-lashed frames of these boats, they dried into a pale, greenish-white, prior to oiling; and were even then almost translucent, tough and strong.

USES OF WALRUS HIDES.—Until I saw the bidarrahs of the St. Lawrence natives in 1874, I was more or less inclined to believe that the tough, thick, and spongy hide of the walrus would be too refractory in dressing for use in covering such light frames, especially those of the bidarka; but the manifest excellence and seaworthiness of these Eskimo boats satisfied me that I was mistaken. I saw, however, abundant evidence of the much greater labor required in tanning or paring down the thick cuticle to that thin, tough transparency so marked on their bidarrahs; for the pelt of the hair-seal, or sea-lion, does not require any more attention when applied to this service than simply unhairing it; this is done by first sweating the "loughtak" in piles, then rudely, but rapidly, scraping, with blunt knives or stone flensers, the hair off in large patches at every stroke; the skin is then air-dried, being stretched on a stout frame, where, in the lapse of a few weeks, it becomes as rigid as a board. When required for use thereafter, it is soaked in water until soft or "green" again, then it is sewed with sinews, while in this fresh condition, tightly over the slight wooden skeleton of the bidarka or the heavier frame of the bidarrah. In this manner the skin-boats and lighters at the islands are covered; then they are air-dried thoroughly before oiling, which is done when the skin has become well indurated, so as to bind the ribs and keel as with an iron plating; the thick, unrefined seal-oil keeps the water out for twelve to twenty hours, according to the character of the hides; when, however, the skin-covering begins to "bag in" between the ribs of the frame, then it is necessary to haul the bidarrah out and air-dry it again, and re-oiling. If attended to thoroughly and constantly, those skin-covered boats are the best species of lighter which can be used at these islands, for they will stand more thumping and pounding on the rocks and alongside ship than all wooden, or even corrugated iron lighters could endure, and remain seaworthy.

MANNER OF DRESSING WALRUS AND SEA-LION HIDES.—I noticed that the St. Lawrence Eskimo pared the walrus hide down from the outer surface or hairy side; while at St. Paul, when it became necessary to reduce the thickness of a sea-lion's skin at spots around the neck and shoulders, the paring was done on the fleshy side. Very little thinning, however, was needed in the case of sea-lion "loughtak".†

GASTRONOMIC QUALITIES OF WALRUS MEAT.—The flavor of the raw, rank mollusca, upon which it feeds, seems to permeate the fiber of the flesh, making it very offensive to the civilized palate; but the Eskimos, who do

the greatest whaling fleet that ever floated, those vessels could not, nor can they now, approach nearer than sixty or even eighty miles of the muddy shoals, sands, and bars upon which the walrus rest there; scattered in herds of a dozen or so in numbers up to bodies of thousands; living in lethargic peace, and almost unmolested, except in several small districts which are carefully hunted over by the natives of Oogashik for oil and ivory. I have been credibly informed that they also breed in Bristol bay, and along the coast as far north as Cape Avinova, during some seasons of exceptional rigor in the Arctic.

* I depart from the Pacific walrus, for a moment, in thus speaking of its Atlantic brother with reference to the testimony of the rocks as to its limit of southern range north of the equator; for the thought of herds of walrus floating down on immense frigid floes over the present low lands of Virginia and North Carolina, and of Anvers and near Paris, France, is an interesting one, relative to the features of the great ice age; down they came, that is certain. Van Beneden and Leidy have recently figured their aged bones as they are silicified or cast in the marls of those southern coasts and interiors. [See Leidy, *Trans. Am. Phil. Soc.*, xi, 1860, Philadelphia. Van Beneden: *Des de Oss. Foss. des Eucirs d'Anvers; Annales Mus. d'Hist. Nat. de Belgique*, 1877, tome i, pp. 40-41.] No such bones have as yet been found on the northwest coast, or in Alaska.

† When I stepped, for the first time, into the baidar of St. Paul island, and went ashore, from the "Alexander", over a heavy sea, safely to the lower bight of Lukannon bay, my sensations were of emphatic distrust; the partially water-softened skin-covering would puff up between the wooden ribs, and then draw back, as the waves rose and fell, so much like an unstable support above the cold green water below, that I frankly expressed my surprise at such an outlandish craft. My thoughts quickly turned to a higher appreciation of those hardy navigators who used these vessels in circumpolar seas years ago, and the Russians, who, more recently, employed bidarrahs chiefly to explore Alaskan and Kamtehatkan *terra incognita*. There is an old poem in *Ætius*, written by a Roman as early as 445 A. D.; it describes the ravages of Saxon pirates along the southern coasts of Britain, who used just such vessels as is this bidarrah of St. Paul.

Quin et armoricus piratim Saxona tractus
Spirabat, cui pelle falum fulcare Britannum
Ludus, et assuto glaucum mare findere lembo.

These boats were probably covered with either horse or bull's hides. When used in England they were known as *coracles*; in Ireland they were styled *curachs*; Pliny tells us that Cæsar moved his army in Britain over lakes and rivers in such boats. Even the Greeks used them, terming them *karabia*; and, the Russian word of *korabl*, or "ship", is derived from it. King Alfred, in 870-872, tells us that the Finns made sad havoc among the Swedish settlements on the numerous "meres" (lakes) in the moors of their country, by "carrying their ships (baidars) overland in the meres whence they make depredations on the Northmen; their ships are small and very light".

All air-dried seal pelts, no matter whether hair- or fur-seal, sea-lion or walrus hides, are called by the Aleutians, and also by the Kamtehadales, "loughtak" or "loftak". When the natives of Kamtehatka told Steller in 1740-42, that the large hair-seal, *Phoca barbata*, was known to them as "loughtak", they evidently did not give him their specific name for the seal; but rather expressed their sense of its large skin, which was so highly prized by them as to be "the loughtak" of all other loughtak in those waters of their country. *Erignathus barbatus* has never been seen around or on these islands of the Pribylov group, but every air-dried fur-seal, or sea-lion skin, there, is called "loughtak" by the people.

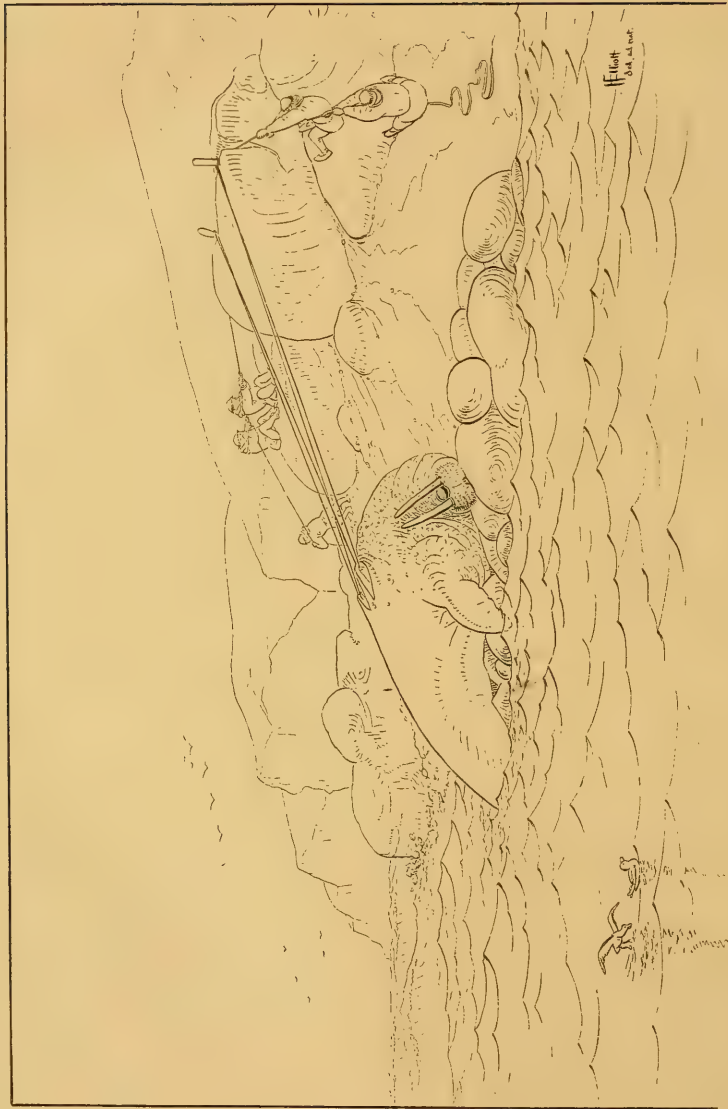
not have the luxurious spread of sea-lion steak and fur-seal hams, regard it as highly and feed upon it as steadily as we do our own best corn-fed beef. Indeed, the walrus to the Eskimo answers just as the cocoa-palm does to the South Sea islander; it feeds him, it clothes him, it heats and illuminates his "igloo"; and it arms him for the chase, while he builds his summer shelter and rides upon the sea by virtue of its hide. Naturally, however, it is not much account to the seal-hunters on the Pribylov islands; they still find, by stirring up the sand-dunes and digging about them at Northeast point, all the ivory that they require for their domestic use on the islands, nothing else about the walrus being of the slightest economic value to them. Some authorities have spoken well of walrus meat as an article of diet; either they had that sauce for it born of inordinate hunger, or else the cooks deceived them. Starving explorers in the arctic regions could relish it—they would thankfully and gladly eat anything that was juicy, and sustained life, with zest and gastronomic fervor. The Eskimo naturally like it; it is a necessity to their existence, and thus a relish for it is acquired. I can readily understand, by personal experience, how a great many, perhaps a majority of our own people, could speak well, were they north, of seal meat, of whale "rind", and of polar bear steaks, but I know that a mouthful of fresh or "cured" walrus flesh would make their "gorges rise". The St. Paul natives refuse to touch it as an article of diet in any shape or manner. I saw them removing the enormous testicles of one of the old bull walrus which was shot, for my purposes, on Walrus island; they told me that they did so in obedience to the wish of the widow doctress of the village, Maria Seedova, who desired a pair for her incantations.

Curiosity, mingled with a desire to really understand, alone tempted me to taste the walrus meat which was placed before me at Poonook, on St. Lawrence island; and candor compels me to say that it was worse than the old beaver's tail which I had been victimized with in British Columbia; worse than the tough brown-bear steak of Bristol bay—in fact, it is the worst of all fresh flesh of which I know; it has a strong flavor of an indefinite acrid nature, which turned my palate and my stomach instantaneously and simultaneously, while the surprised natives stared in bewildered silence at their astonished and disgusted guest. They, however, greedily put chunks, two inches square and even larger, of this flesh and blubber into their mouths as rapidly as the storage room there would permit; and, with what grimy gusto! the corners of their large lips dripping with the fatness of their feeding. How little they thought then, that in a few short seasons they would die of starvation sitting in these same igloos—their caches empty and nothing but endless fields of barren ice where the life-giving sea should be. The winter of 1879-80 was one of exceptional rigor in the Arctic, although in the United States it was unusually mild and open. The ice closed in solid around St. Lawrence island—so firm and unshaken by the giant leverage of wind and tide, that the walrus were driven far to the southward and eastward beyond the reach of the unhappy inhabitants of that island, who, thus unexpectedly deprived of their mainstay and support, seem to have miserably starved to death, with the exception of one small village on the north shore. The residents of the Poonook, Pogovellyak, and Kagallegak settlements perished, to a soul, from hunger; nearly three hundred men, women, and children. I recall the visit which I made to these settlements, in August, 1874, with sadness, in this unfortunate connection, because they impressed me with their manifest superiority over the savages of the northwest coast. They seemed, then, to be living, during nine months of the year, almost wholly upon the flesh and oil of the walrus. Clean limbed, bright eyed, and jovial, they profoundly impressed me with their happy reliance and subsistence upon the walrus herds of Bering sea. I could not help remarking then, that these people had never been subjected to the temptations and subsequent sorrow of putting their trust in princes; hence, their independence and good heart. But now it appears that it will not do to put your trust in walrus, either.

I know that it is said by Parry, by Hall, and lately by others, that the flesh of the Atlantic walrus is palatable; perhaps the nature of food-supply is the cause. We all recognize the wide difference in pork from hogs fed on corn and those fed on beech mast and oak acorns, and those which have lived upon the offal of the slaughtering houses or have gathered the decayed castings of the sea shore; the walrus of Bering sea lives upon that which does not give pleasant flavor to its flesh.

IMPERFECTION OF WALRUS IVORY.—Touching the ivory, I was struck, in looking over the tusks as they protruded from the live animals' mouths, by the fact that only rare examples of perfect teeth could be found; they were broken off irregularly, some quite close to the socket, hardly a single animal having a sound and uniform pair of tusks. Most of the walrus ivory taken is of very poor quality; it has a deep core, or yellow, suspended pith, and is frequently so cracked, where the ivory is the whitest and the firmest, as to be of mere nominal value; but exceptional teeth now and then occur, of prodigious size and superior texture; these are carefully treasured and sold to great advantage.

THE ANTIQUITY OF WALRUS HUNTING.—Generally, when we look for the earliest records of this or that action or occupation, we are treated to a vast store of indeterminate material, upon which any theory or conjecture may be raised. But, touching the case of the hunting of the fur-seal and the walrus, in northern waters, we have exact data as to records of the earliest chase and capture of these animals by our own people. The history of walrus hunting comes down to us from rare old antiquity, in this way: Shortly after 868 A. D., King Alfred, of England, gave a translation of the Spanish *Ormestra*, or "*Di miserere mundi*," of Paul Orosius, in his mother tongue, the Anglo-Saxon; into this complete and only geographical review of the earth's form, as known at



"DOUBLE PURCHASE" OF THE ESKIMO.

Innuits of St. Lawrence Island, Alaska, hoisting a Walrus carcass.

that time, he interwove the relations of Othere and the Dane Wulfstan. The former was a great man from Norway; he undertook a voyage of discovery beyond the north cape of his native land, and to the then unknown eastward as far as our modern Finland, which he indicated as the "country of the Beornas". He shaped his course to this region, "on account of the horse whales, inasmuch as they have very good bone in their teeth"; also, "this sort of whale is much less than the other kinds, it being not larger commonly than seven ells"; and states further that he, Othere, "had killed fifty-six in two days".

DESCHNEV THE FIRST TO SEE THE WALRUS OF BERING SEA.—The earliest personal record made of the walrus of Bering sea, was the discovery of these animals by Simeon Deschnev, that Cossack who, first of all civilized men, sailed through Bering straits, October, 1648; and who made use of their ivory, *en voyage*, in repairing his rude shallop. He also, in 1651, discovered extensive sand shoals north of the Anadyr mouth, upon which large herds of walrus were resting. But in this connection it is proper to say, that the walrus of Bering sea is the same animal of which Isaiah Ignatiev learned in 1646, when he led a party of Russian fur-hunters east of the mouth of the Kolyma as far as Tchaun bay. He did not see it, however, and traded with the Tschukchies for the teeth in question. His report of a nation rich in walrus ivory far to the eastward along the shores of the Polar ocean, is what stimulated the remarkable voyage of Deschnev, above referred to, as well as many others who were not so successful,* viz: Staduchin, Alexiev, Ankudinov, Buldakov, all in 1647-1649.

BOREAL RANGE OF THE WALRUS OF BERING SEA.—The range of the Bering sea walrus now appears to be restricted in the Arctic ocean to an extreme westward at Cape Chelagaskoi, on the Siberian coast, and an extreme eastward between Point Barrow and the region of Point Beechey, on the Alaskan shore. It is, however, substantially confined between Koliutchin bay, Siberia, and Point Barrow, Alaska. As far as its distribution in polar waters is concerned, and how far to the north it travels from these coasts of the two continents, I am unable to present any well authenticated data illustrative of the subject; the shores of Wrangell Land were found this year (1881) in possession of walrus herds.

The Japanese seem to have known of the walrus of Bering sea, but evidently have not observed it—at least, I think so, from the testimony of their spirited drawings of this animal. They represent it with the body, the neck, and the limbs of a horse, running on camel-like feet, with an equine head, from the upper jaw of which two enormous tusks depend; it is made to gallop rather as a land than a sea-horse. The hair-seals are very much better delineated by both Chinese and Japanese artists; and, further, no suggestion, by such means, has been made of the fur-seal by them.

The chief demand for walrus ivory first came, and still comes, from those patient, skillful Mongolian hand-carvers, who work the teeth up into a variety of exceedingly attractive articles, both useful and fanciful. Wrangell says that the Tschukchies "make long, narrow drinking vessels from the teeth", which require much time to hollow out; they are frequently sold to the Reindeer Tschukchies, who convey them to the Russians.

The walrus ivory carving of the Alaskan Mahlemoots, at Oogashik and Nushagak, in particular, is remarkably well executed; clever and even beautiful imitations of our watch chains, guards, table, and pocket cutlery, rings, bracelets, and necklace jewelry are made by them. They have earned the just reputation of being "the sculptors of the north".

PARRY'S HISTORY OF THE ATLANTIC WALRUS.—In closing here this brief biography of the walrus of Bering sea, I desire to say that the graphic and detailed account given by Sir Edward Parry, in the narrative of his third voyage to the north pole, of the manner in which the Eskimo hunt and use the walrus of Prince Regent inlet (*Odobenus rosmarus*), fitly expresses my own observations made at St. Lawrence island, among the Tschukchie Eskimo there; hence, I shall not embody them in type; my illustrations will supply the vacancy which his accurate and lengthy description alone allows† I call attention to this economic history of the Atlantic walrus by Parry, for, in my opinion, it is written with great fidelity.

*Allen erroneously gives the credit (on p. 172, *Hist. of N. A. Pinnipeds*) of first discovery and report of the walrus ivory of Bering sea to "the Cossak adventurer Staduchin, who found (about 1645 to 1648) its tusks on the Tschukchie coast, near the mouth of the Kolyma river. A century later, Deschnev also found large quantities of walrus teeth on the sand-bars at the mouth of the Anadyr". Michael Staduchin did not sail from the Kolyma mouth until 1649. He ventured at that time as far east probably as Cape Chelagaskoi; he was obliged to return then, after getting a load of walrus teeth from the Tschukchies, but from whom he could get no meat or provision of any kind; he saw no more than his predecessor, Ignatiev, did, three years prior; in other words, he did not then see the walrus itself.

†As the natives of the Pribylov islands do not hunt the walrus, I have, in my studies of this animal, introduced the figures, method, and costumes of the St. Lawrence Eskimo, which faithfully typify the entire Alaskan people, who live largely upon the flesh of this animal. I do so, not only on account of its being wholly germane to the subject of my discussion in this monograph, but more so, as it is the first pictorial presentation of the ideas involved ever given.

H. THE REPRODUCTION OF THE FUR-SEAL, SEA-LION, AND WALRUS.

19. THE REPRODUCTION OF THE FUR-SEAL.*

OBJECT OF THIS DISCUSSION.—By treating this subject at length, my object is to fix attention upon several points connected with the reproduction of the fur-seal which have vital importance to its relation with, and residence upon, the breeding-grounds of these islands under discussion. In the first place, naturalists generally have taken notice of the procreative apparatus exhibited by the *Phocidæ*; and, while they have spoken at length in anatomical detail and discussion of the male organs of the *Otariidæ*, yet, they exhibit a strange neglect or oversight with respect to those of the female. The singular cloacal arrangement of the female organs of generation in the *Phocidæ* has excited comment and description from the earliest times.

OVERSIGHT OF OTHER WRITERS.—The modification of the reproductive apparatus peculiar to the male *Otariidæ*, in contradistinction with those organs possessed by the male *Phocidæ*, has been noticed to some extent by several authorities† prior to the date of this publication; but, while calling attention to those marked changes in the morphology of the male organs of the *Otariidæ*, they are silent in regard to the fact that, though the *Phocidæ* are very distinct, by the armature of the males, from the *Otariidæ*, yet the cloacal arrangement of the females in both genera is identical. This is in itself, as I view it, quite as remarkable with regard to the females as it is noteworthy in respect to the males. Surely the wonderful modification of the physical structure of the male fur-seal from that of his kindred, the hair-seal, is very great; and we are not surprised to find that his generative organs are pronounced, in common with all the others, distinct. So the females differ, physically, in every respect, to as great a degree, with the solitary exception of the intra-uterine life, and the cloacal form of the external genitalia.

NECESSITY OF UNDERSTANDING THIS SUBJECT.—This subject of the method of reproduction, as carried out by the fur-seals on the breeding-grounds of the Pribylov islands, should be understood distinctly and authoritatively, before the truth or falsity of certain hypotheses, which depend upon it, can be intelligently discussed. The general impression and commonly-received opinion in the popular, as well as the scientific world, is that the amphibian life of the ocean breeds in the water thereof; or, in other words, that the fertilization of the seal-life takes place by coition therein, and that the young may be born in this watery element, safely nurtured and cared for by their mothers.‡ No end of fanciful rumor and romance has been published touching this point. We are told that some man of great credibility, has seen seals in the water, with their new-born clasped on their bosoms, rising in the waves to look at their disturbers, and then sinking, to carry away their young to safety and quiet. By this fanciful description, undoubtedly, the mermaid owes its origin in our recent mythology; for the hair-seal, in especial, has a bland, round, full physiognomy; the large circular eyes are placed more in front of the skull than in the crania of any other genera of its kind. Such a head popping up suddenly in front of the mariner might

*When they the approaching time perceive,
They flee the deep, and watery pastures leave;
On the dry ground, far from the swelling tide,
Bring forth their young, and on the shores abide
Till twice six times they see the Eastern gleams
Brighten the hills, and tremble on the streams;
The thirteenth morn, soon as the early dawn
Hangs out its crimson folds or spreads its lawn,
No more the fields and lofty coverts please,
Each hugs her own, and hastes to rolling seas.

—Old Roman Poem: *Hair-seals of the Mediterranean.*

† Allen: *North American Pinnipeds*, 1880. Murie: *Trans. Zool. Soc.*, 1869-72.

‡ Reasonably enough, the closet naturalist, no matter how able, will be deceived now and then in this manner by untrustworthy statements made by those who are supposed to know by personal observation of what they affirm.

As an apt illustration of the confusion which the best of closet of naturalists are thrown into by irrepressible information touching this very matter, I may cite the case of Hamilton, who, in 1839, while writing of the fur-seal of Cook and Forster, discovered particularly by them on South Georgia, in 1771, declares it to be no fur-seal at all! He feels warranted in doing so, because one Captain Weddell says so. This authority was a hardy sailor who made sealing a specialty in the Antarctic during 1823-26. Hamilton, after specifying the wide range of this *Arctocephalus*, "at Dusky bay, New Zealand, in New Georgia, Staten Land, Juan Fernandez, and the Gallapagos", goes on to say—

"It will be observed that several of these authorities, particularly Dampier and Cook, speak of the fineness of the fur of this seal. It is probably these statements which have led the able author of the article *Phoque*, in the *Dict. Classique d'Hist. Naturelle*, to state that this seal is the fur-seal of commerce. His words are: 'L'otarie de Forster est le Phoque à fourrures des pêcheurs européens.' But this, we suspect, is a mistake. No one will doubt that Captain Weddell was familiar with the fur-seal. He was also familiar with the ursine-seal, both as encountered in its haunts and as described by naturalists; and yet, when speaking of the ursine-seal (so denominated by him), he never once hints that its fur has any peculiar value, but the contrary." [*Amphibious Carnivora*: Edinburgh, 1839, p. 265.]

Thus Hamilton quotes this old mariner, Weddell, throughout his whole memoir, with the utmost trust; and in the same manner others have been cited. They are worthless, unless taken "cum grano salis". The sum and substance of it is this: when most of the sea-faring sealers and whalers are in the field, they are blind to everything except the mere capture of their quarry. When they return, they are importuned for those details which, in fact, they have never thought of while away.



WALRUS ISLET.

Showing the Walrus as it herds, and the peculiar zones of breeding-birds.

A. Cliff fronts occupied by the Rissa and Kittiwake gulls, and the cormorant (*Rissa brevirostris*, *Larus tridactylus*, and *Graculus leucostictus*). b b b. Plateau belt covered by the Arvies (*Lombia arva*) to the exclusion of all other water-fowl. It is white with the droppings of these birds. c c c. The grassy interior, occupied chiefly by the Burgomaster gull (*Larus glaucus*), and a few *Rissa* and *L. tridactylus*. d. Rocky shingle and loose surf-thrown boulders, between and in the clinks of which the Auks and Fulmars nest. e. Walrus herds on the "Echouries."

naturally suggest a human face; and it needs but a very little embellishment to trim it with long tresses, place mammae on its bosom, and all the other peculiar attributes of the yellow-haired mermaid so celebrated in song and art.

FINE OPPORTUNITIES FOR OBSERVATION.—Therefore, what I wish to distinctly settle with regard to the reproduction of the fur-seal, which I now have under consideration, is that mooted question as to the place, the manner, and the time of the union of the two sexes necessary for the procreation of their kind. I have no personal knowledge of the system of fertilization employed, with reference to it, by the *Phocidæ*; hence I shall not attempt to describe it.* What I have heard from the natives would point clearly to the fact, that they know nothing really worthy of scientific attention; but in regard to the fur-seal I have had unusual advantages, and an extended experience, ranging over four consecutive breeding-seasons, in which thousands of these animals, all perfectly in unison, have passed within the scope of my observation and record.

GENITALIA OF THE MALE AND FEMALE FUR-SEAL.—Considering the male *Callorhinus*. When it is first born the external organs of generation are not evidenced to the sight, and it requires a nice touch to find them under the skin. It is not until this animal has rounded off the second year of its existence, that the testicles descend and become outwardly exposed: first, faintly, but rapidly succeeding to the same prominence and same relative position that they occupy in the example of the dog. When this creature attains three and four years of age, its testes hang pendant in a somewhat flabby scrotum, which in the old male is as pendulous as that of the bull in the *Bovidæ*; the sack is smooth and shiny, entirely devoid of hair, and black, with a slightly wrinkled surface. The sheath of the penis is so merged with the skin of the abdomen that it does not lie ribbed there and prominent as in the other carnivora; but it is an erectile organ, with a bony skeleton, when fully developed, that measures from five to seven inches in length. During excitement its appearance is closely, if not exactly, similar to that organ of the dog. The females have their parts of generation precisely as they are described by Owen and Huxley—which descriptions are based upon examples of the well-known *Phocidæ*; their external organs are entirely concealed, by the fact that the rectum terminates on the opposite side of the vulva; and a common, somewhat flaccid, sphincter closes both apertures. In other words, the anal and genital openings of the female are united into a single one, through which the regular secretions of the body pass, and the forces of reproduction are received and introduced. Thus, while the female *Phocidæ* correspond in this respect with the female *Otaridæ*, yet the extraordinary development of the male organs in the *Otaridæ* are quite marked in their normal rising, when contrasted with their subsidence, as exhibited by those peculiar to the *Phocidæ*.†

NO EVIDENCE OF RUTTING ODORS: SPEEDY BIRTH OF PUPS.—When the male fur-seals, or “seeatchie”, as the natives call them—a term implying strength and virility—arrive first upon the breeding-grounds, long before the coming of the females, as described in a preceding chapter of this monograph, they give no evidence of being in rut; nor do they emit any odor during the rest of the season which at all resembles the “rutting odor” ascribed to many animals. I call attention to this because a common blunder has been made, and likely will be made, whereby the smell upon the rocks, so far-reaching and so offensive, is called the “rutting funk”. It is, as I have also stated, due to other causes which are conspicuous and which have been specified heretofore. When the females came to land upon the breeding-grounds, I noticed that, with the exception of the virgin cows, they were heavy with maternity; that the period of their gestation must soon culminate by the birth of their offspring, which usually took place within a couple of hours after they reached the shore, or within as many days at the most. Frequently I have observed the mothers land, and ere they were dry the young would be expelled; and the thought rose then to my mind “how wonderfully well-timed is this return of those gravid cows”—for, in spite of tempests and currents, and many of them quite two and three thousand miles from their winter feeding-places, yet they reach this land-speck in Bering sea just in season for instant delivery after arrival!‡

* The inconsequential numbers of the hair-seal around and on the Pribylov islands, seem to be characteristic of all Alaskan waters and the northwest coast; also, the *Phocidæ* are equally scant on the Asiatic littoral margins. Only the following four species are known to exist throughout the entire extent of that vast marine area, viz:

PHOCA VITULINA.—Everywhere, between Bering straits and California.

PHOCA PECTATA.—Plover bay, Norton's sound, Kuskokvim mouth, and Bristol bay, of Bering sea; Cape Sewart Kammin, Arctic ocean to Point Barrow, and also over the entire extent of the polar coast of Siberia.

ERIGNATHUS BARBATUS.—Kamchatkan coast; Norton's sound, Kuskokvim mouth, and Bristol bay, of Bering sea.

HISTRIOPHOCA FASCIATA.—Yukon mouth, and coast south to Bristol bay, of Bering sea, and drifting ice therein.

Then, in addition to this, Mr. Ivan Petrov, the Alaskan special agent of the Tenth Census, United States, reports the presence of a land-locked seal in the fresh waters of Iliamna lake, and also in lake Walker. It may be as distinct from all of the *Phocidæ* above enumerated as is the Baikal or the Caspian seals; and, as such, I suggest that it shall receive the name of *Phoca petrovi*, when it is eventually secured, and if identified as new to our lists.—*Preliminary Report of Progress, Census of Alaska*: Ivan Petrov, Washington, December, 1890: p. 45.

In this connection it is a somewhat curious fact, that the description which Aristotle [300 B. C.] gives of the hair-seal (*Monachus albiventer*, very likely) is, in most respects, correct; while Buffon, the celebrated French zoölogist, as late as 1785, has not, despite his vast advantages, been nearly as accurate in his treatment of the pinnipeds. That this old Grecian philosopher, three hundred years before the Christian era, should have done better in this respect than that world-wide distinguished academicien did more than two thousand years afterward, affords an entertaining suggestion as to the alleged degeneracy of the present age, especially so since the monument erected over Buffon's remains bears an inscription which declares that he possessed “a mind equal to the majesty of nature”. (!)

† See Owen's *Anatomy of Vertebrates*, vol. iii, p. 639, London, 1863. The *Phocidæ* are the subject of this eminent author's examination and report.

‡ If there is any one faculty better developed than the others in the brain of the intelligent *Callorhinus*, it must be its “bump” of locality. The unerring directness with which it pilots its annual course back through thousands of miles of watery waste to these

PANGS OF IMPENDING PARTURITION ALONE PROMPT FEMALES TO LAND.—The females do not land until they are obliged to by the precipitation of this event of parturition. They appear over the breeding-grounds of St. Paul just as they come in contact with the shore—guided and influenced at the moment of approach to the islands by only one ruling thought, and that is, to reach as near as possible the locality upon which they resided in former years. Soon after landing, which I have heretofore described, the birth of the young takes place, and in this wise: the cow shows, an hour or so prior to delivery, great nervous agitation; she trembles all over; her eyes blinking, and flippers twitching; rolling, stretching, and thoroughly uneasy, until the labor-pains ensue. If the ground where she happens to rest is rocky, she manages to lie upon the top of a boulder, her hind-flippers work spasmodically with a wavy, fan-like motion backward and forward, as she rests full upon her stomach, with the fore-flippers alternately pressed tightly to the rock or closely to her sides, like pectoral fins; she sways her head, her eyes are partly closed and her mouth slightly opened in panting, during the fifteen or twenty minutes which usually ensue between the first contraction of the uterus, until the expulsion of the intra-uterine life takes place. These labor-pains are not, in my opinion, at all very severe or abnormal in any respect. The pup carries with it, at the moment of birth, the entire placental pouch or “after-birth”. This envelope is broken, usually by the mother, in forcing the labor and during the first expulsion of the pup’s head, which is always presented in advance. The little “kotiek” may be said to fairly drop upon its feet, for the moment it appears from within the natal walls it seems to be in full possession of all its faculties; its eyes are wide open, and its voice is raised in weak, husky bleatings, as it feebly paddles around, still attached to the umbilical cord, which, by its own efforts, it pulls asunder as it flounders about on the rocks or ground of the rookery. The mother, in the meantime, gives her offspring none of that attention so marked in the case of the *canidae* and other carnivores, not even turning to look at it; but she draws herself up with an expression of intense comfort and relief, throwing her head back with a gentle, swaying motion, as she fans herself slowly with either one or both of the hind-flippers. She also pays no attention to the cleansing of her own person, the after-birth lying undisturbed by her; it will be speedily trampled under foot and ground out of recognizance by the restless multitudes around her, that pass to and fro. The pup quickly dries off, with rapid alternations of short naps and awakenings, in which it gets up and on its flippers to essay brief scrambles over the rocks and ground until, in nosing about, it claims the attention of its mother (sometimes hours after birth); this she gives by gently elevating her abdomen and turning her parts posteriorly, so that one or two of the obscure teats, filled with milk, can be seized by the hungry pup, which now nurses therefrom greedily, even to gorging itself.

MILK OF THE FUR-SEAL.—The milk of the fur-seal mother is very rich and creamy, and the secretion is always abundant, but there is not, under any circumstances, the enlarged udder and mammae peculiar to dogs and similar animals; the nipples are scarcely distinguishable, even when exposed to the reach and notice of the young.

IRREGULAR FEEDING OF THE PUPS.—The umbilicus of the pup rapidly sloughs off, and the little fellow grows apace, nursing to-day heartily in order that he may, perhaps, go the next two, three, or four days without another drop from the maternal fount; for it is the habit of the mother-seal to regularly and frequently leave her young,

spots of its birth—small fly-dots of land in the map of Bering sea and the North Pacific—is a very remarkable exhibition of its skill in navigation. While the Russians were established at Bodega and Ross, California, sixty years ago, they frequently shot fur-seals at sea, when hunting the sea-otter off the coast between Fuca straits and the Farallones. Many of these animals, late in May and early in June, were so far advanced in pregnancy that it was deemed certain by their captors that some shore must be close at hand upon which the near impending birth of the pup took place; thereupon, the Russians searched over each rod of the coast-line of the mainland and the archipelago, between California and the peninsula of Alaska, vainly seeking everywhere there for a fur-seal rookery. They were slow to understand how animals, so close to the throes of parturition, could strike out into the broad ocean to swim 1,500 or 2,000 miles within a week or ten days ere they landed on the Pribylov group, and, almost immediately after, give birth to their offspring.

There is no record made which shows that the fur-seals have any regular or direct course of travel up or down the northwest coast. They are principally seen in the open sea, eight or ten miles from land, outside the heads of the straits of Fuca, and from there as far north as Dixon sound. During May and June they are aggregated in greatest numbers here, though examples are reported the whole year round. The only fur-seal that I saw, or which was noticed by the crew of the “Reliance”, in her cruise, June 1 to 9, from Port Townsend to Sitka, was a solitary “holluschack” that we disturbed at sea well out from the lower end of Queen Charlotte island; then, from Sitka to Kadiak, we saw nothing of the fur-seal until we hauled off from Point Greville, and coming down by Ookamok islet, a squad of agile “holluschickie” suddenly appeared among a school of hump-back whales, sporting in the most extravagant manner around, under, and even leaping over the wholly indifferent cetaceans. From this eastern extremity of Kadiak island clear up to the Pribylov group we daily saw fur-seals here and there in small bands, or also as lonely voyageurs, all headed for one goal. We were badly outtailed by them; indeed, the chorus of a favorite “South-Sea pirate’s” song, as incessantly sung on the cutter’s “tween decks”, seemed to have special adaptation to their vanishing forms:

“For they bore down from the windward,
A sailin’ seven knots to our four’n.”

The ancient Greeks seemed to have been impressed somewhere by rookery odors, since Homer says—

“The web-footed seals forsake the stormy swell,
And, sleeping in herds, exhale nauseous smell.”

Where this illustrious bard sniffed up this characteristic unpleasantness of breeding-seals, I am at a loss to say. The Pribylov islands and the great Antarctic grounds were as far from that poet then, as the moon is from us to-day. He must have been introduced to it within the confines of the Caspian sea, or else credibly informed, by trustworthy authority, of this peculiarity of the large herds of *Phocidæ* in those waters. Small bands, however, of hair-seals breed now, as they bred then, in the Mediterranean and Black seas. He may have stumbled upon a few of them while provoking his muse in lonely travels over Grecian pelagic shores.

on this the spot of its birth, to repair for food in the sea; she is absent by these excursions, on account of the fish not coming inshore within a radius of (at the least) one hundred miles of the breeding-grounds, through intervals varying, as I have said, from a single day to three or four, as the case may be. The manner in which she returns after feeding, and in which she singles out by scent, and at a glance, her own offspring from many thousands surrounding it, I have clearly described in a foregoing chapter.*

PRELIMINARY ADVANCES OF THE SEXUAL UNION.—The pup being born, the cow rapidly passes into "heat". I have noticed examples where ten hours only elapsed between the event of the birth and that of copulation, and I doubt not of full impregnation for another period. But as a rule forty-eight hours will be the fair figure to express the time from the birth to the appearance and desire known as "being in heat". The cow always makes the first advances to the bull. If she is one of the earlier subjects for his attention, it is no sooner said on her part than done on his; but should she be of the later applicants in his harem, after he has been more or less wearied and exhausted by the vital drafts made upon him, she must wait. I have observed instances of this character in which the female teases the male for hours and hours before arousing his desire. Indeed, I had brought strongly to mind that same coquetting so comically rendered in the barn-yard of almost every farmer, where the turkey-hen solicits the turkey-cock. When thus teasing the male, the female crouns up by his shoulders, playfully biting and pulling at his neck and mouth, stretching herself flat and quivering posteriorly before him, until the hot blood of desire is excited in the wearied and languid male, and then he closes the pantomime.

PELAGIC COITION IMPOSSIBLE.—In this act of coition on these breeding-grounds of St. Paul and St. George, I have noticed the fact, that whenever the female was well covered by the male on the flat or smooth shelves of rock or earth, then they moved and shuffled about without any particular effective coition until brought up against a rougher inequality, or some fragments of lava shingle, so characteristic of the rookery grounds. The reason for this is due to the fact, that in spite of the great weight of the male, six times more than that of the female which it covers, the orgasms are so rapid and violent that, unless the female is held by some other agency than the weight of the male, she is literally shoved ahead and away from under him. This fact I call attention to, as it alone is sufficient, upon the slightest reflection, to satisfy any judicial mind that it is a physical impossibility for these seals to copulate in the water. Under no conceivable position assumed for this supposed pelagic coition could effectual sexual connection be made.†

ACTION OF REPRODUCTION.—The male serving the female covers her exactly as a big Newfoundland dog would mount a small terrier slut. The "seecatchie" draws his heavy body over and upon the outstretched spine of the female, which lies prone before him on her stomach; so that when the male has adjusted himself, which he does by arching his back from the shoulders to the *os coccyx*, he covers her so completely that nothing of her form can be seen, except a portion of her head just peering out from between his fore-flippers and under his broad chest. The tips of her hind-flippers are now and then visible, as he humps his back with each succeeding orgasm. Notwithstanding their great rapidity and the muscular power employed, these orgasms last, without interruption, for the surprising space of from eight to fourteen minutes—not a second's intermission. Of course, toward the close of the season, when the male is tired, he does not remain *in coitu* longer than three or four minutes. On account of the vigor and duration of this first coitus, I am inclined to think that that female has no further intercourse with that male, or any other one, during the rest of the season. She is satisfied, and passes rapidly out of heat. Certain it is that she is

* When the females first come ashore there is no sign of affection manifested, whatever, between the sexes. The males are surly and morose, and the females entirely indifferent to such reception. They are, however, subjected to very harsh treatment sometimes in the progress of battles between the males for their possession, and a few of them are badly bitten and lacerated every season.

One of the cows that arrived at Nah Speel, St. Paul island, early in June, 1872, was treated to a cruel mutilation in this manner, under my eyes. When she had finally landed on the baroûn rocks of one of the numerous "seecatchie" at the water front of this small rookery, and while I was carefully making a sketch of her graceful outlines, a rival bull, adjacent, reached out from his station and seized her with his mouth at the nape of the neck, just as a cat lifts a kitten. At the same instant, almost simultaneously, the old male that was rightfully entitled to her charms, turned, and caught her in his teeth, by the skin of her posterior dorsal region. There she was, lifted and suspended in mid-air, between the jaws of her furious rivals, until, in obedience to their powerful struggles, the hide of her back gave way, and, as a ragged flap of the raw skin more than six inches broad and a foot in length was torn up and from her spine, she passed, with a rush, into the possession of the bull which had covetously seized her. She uttered no cry during this barbarous treatment, nor did she, when settled again, turn to her torn and bleeding wound to notice it in any way whatsoever that I could observe.

When severe inflammation takes place, they seek the water, disappearing promptly from your scrutiny.

† Those extremely heavy adult males which arrive first in the season, and take their stations on the rookeries, are so fat that they do not exhibit a wrinkle or a fold of the hide enveloping their blubber-lined bodies; most of this fatty deposit is found around the shoulders and the neck, though a warm coat of blubber covers all the other portions of the body save the flippers; this blubber thickening of the neck and chest is characteristic of the adult males only, which are, by its provisions, enabled to sustain the extraordinary protracted fasting periods incident to their habit of life and reproduction.

When those superlatively fleshy bulls first arrive, a curious body tremor seems to attend every movement that the animals make on land; their fat appears to ripple backward and forward under their skins, like waves; as they alternate with their flippers in walking, the whole form of the "seecatchie" shakes as a bowl full of jelly does when agitated on the table before us.

There is also a perfect uniformity in the coloration of the breeding coats of the fur-seals; and it is strikingly manifest while inspecting the rookeries late in July, when they are solidly massed thereon. At a quarter mile distance, the whole immense aggregate of animal life seems to be fused into a huge homogeneous body that is alternately roused up in sections and then composed, just as a quantity of iron filings, covering the bottom of a saucer, will rise and fall, when a magnet is passed over and around the dish.

not noticed by him again; she goes up to his seraglio-grounds, to and from the sea, seeking her young and feeding undisturbed for the balance of the time; also, that the other bulls seem to recognize this condition of passed sexual requirement and satisfaction, in her case, by paying her no further attention.

PERIOD OF GESTATION.—Thus it is apparent that the period of gestation in the fur-seal is nearly, lacking a few days, twelve calendar months; for, the next year finds her again heavy with young, at almost exactly the same day that she gave birth to her previous offspring in the prior season. The systematic and regular appearance of the females every year upon the Pribylov islands at such a time, usually in late June and early July, without the slightest regard to what the weather may have been during the winter and spring previous, or is when they land, establishes without doubt this exact limit of their gestation.

IMPORTANCE OF THIS SERVICE.—The reason why I dwell upon these details, is because they have a very important bearing upon the question as to what ratio of males every year is needed for service on this great breeding-ground of Bering sea. If the common opinion, hitherto entertained, was tenable, of free and effective pelagic coition, then it will be readily understood that nearly all the males from four years up, could have easy access to the females; and, that it would be a matter of very small concern how many old males, or rather those males upon the land located over the rookeries, were fit for service. But, understanding, as I now do, without a shadow of tenable contradiction, that these "seecatchie" which receive, fight for, and cover the females on the rookeries, are the only active fertilizing powers toward the reproduction and perpetuation of their kind, the importance of my detailed description of the method of coition is evident; for it shows conclusively, that unless we see every year, long prior to the arrival of the females, a full supply of able-bodied "seecatchie" holding out upon and located over the rookeries of St. Paul and St. George—unless we see such a number in good condition—we may safely count upon the fact that danger will arise of imperfect and nugatory fertilization for the coming year. It will not do to indulge the hope, should a scarcity or diminution of the old males ever occur, when the rookeries are mapped out in spring, of the deficiency being made good by the young males which are swimming around everywhere in the water.

VITALITY OF THE MALE.—I believe that an able-bodied adult "seecatchie" is capable of serving well from the 14th June to the 14th July, during which period the height of the breeding-season occurs, one hundred females. If he is, however, as he frequently is, enfeebled by previous fighting and struggling with other males to hold the station which he has selected and fought for, it is more than likely that his virility will not extend beyond the proper serving of twenty or thirty cows. As I have said in another place, I found great difficulty in settling, to my own satisfaction, a fair number of females as the average to every harem on the rookery.* Some instances occur where the male treats forty-five or fifty females, owing to the peculiar configuration of the landing grounds; but most generally, and as the rule, I think fifteen or twenty cows to every bull is a true computation; hence, I do not believe that under any normal circumstances and all normal disadvantages, such as fighting involves by weakening the males, that, when the females arrive, there is the least risk of a single one of them getting back to the water without a perfect and effectual impregnation. A common opinion was prevalent on the islands among the employés touching this matter, that, when the female was not instantly covered during her first heat, she went to the water, cooled off, and on returning, sexual desire never reappeared; and thus she became a *farroe* or barren cow from that time to the end of her natural life. Analogous physiology confutes this completely; that such warm-blooded, highly-organized creatures should never have a rapid recurrence of sexual desire, in common with all other animals of their class, until it is gratified in the usual way, is not at all probable, though it may be possible.

SMALL NUMBER OF BARREN FEMALES.—To show, however, that a very small proportion of the myriads of breeding females are barren, I have only to present this illustration, which is happy in its conclusion, and easily portrayed: whenever a female ceases to breed she refuses to haul upon the rookeries; she roams with the "holluschickie", or the "bachelors", growing a third heavier and marked with corresponding darker tones to her coat, yet still preserving the familiar pattern of the "matkah", so that she can be picked out quickly by an experienced eye from the old and young males around her. In driving the "holluschickie" up to the killing-grounds every season, the natives noticed, and pointed out to me, those barren cows in the drive, several of which were secured for my examination, and measurement; but the proportion of sterile females is not more than one in a thousand to the "holluschickie" with which they consort.

* This striking an accurate average is still further complicated by that unknown distribution of the virgin females that come up to the rookeries every year for their first meeting with the virile males. What proportion of them reach the rear of the breeding-grounds, compared with their numbers which are served at the water-line? I surely am at fault to say, for they do not leave that tangible evidence which the other older cows do in the forms of their young. One of the curious contradictions to generally received ideas of the habit of seals is the fact, that the fur-seal will not rest either upon snow, or ice; it seems to positively avoid all contact with both of those substances upon which the *Phocidæ* wholly, and the sea-lions to some degree, delight in hauling over. *Callorhinus* has the warmest of seal-coats, by all odds, yet it dreads a snowy or an icy bed with as much sincerity as any habitué of the tropics can. The sea-lions and hair-seals have often been surprised in sporting, or sleeping on the ice floes of Bering sea in the spring, by whalersmen while cruising at the edge of the frozen pack, waiting for the channel to open, clear, into the Arctic ocean; as neither *Eumetopias* nor *Phoca* have any under wool, their sea-jackets are not half as heavy as those peculiar to the bodies of fur-seals; hence in taking personal notice of this odd aversion of the *Callorhinus* to snow and ice, I believe that its dislike is one of pure sentimentality rather than one based on physical inability to rest upon as cold surfaces; for there is not much difference between the water's temperature and that of the snow and ice in the spring—10° Fahr., perhaps—both cold enough at all events.

AGE OF FEMALES WHEN FIRST PREGNANT.—As to the time when the virgin cow is first covered by the bull, I found a strange medley of ideas among the people on the island. The common opinion of the others and the natives was, that they were not covered until they were three years of age, bringing forth their first young in the former case (*i. e.* the generally accepted versions), when they reached their fourth year. But this, on examination, was not a difficult problem at all to solve. The evidence every year decides, while the yearlings are driven up to the village in the fall, that although to external appearance there is no difference between the sexes, an examination conclusively established the fact, that the yearling females herded with the yearling males on the hauling-grounds, each about equal in number, and also when the balance of the "holluschickie", two-year-olds and upward, were driven in they never found a female* in the droves. Where were these two-year-old females then? They were not upon the hauling-grounds with the yearling females and bachelors. Where were they? The answer is, they have come up on the breeding-grounds, clothed with desire and supplied with physical life to meet prospective maternity.

RELATIVE DURATION OF LIFE: TERRESTRIAL REPRODUCTION.—This fact also shows that, as the female fur-seal is so conspicuously inferior to the male, physically viewed, as to size and weight, so also is her life lessened. In other words, when she is matured, as she must be by her third year, in bearing then her first pup, she can reasonably be expected to live no longer than nine or ten years, according to the general natural law governing this question; while the male, not coming to his maturity and physical prime until he is five or six years of age, lives, in obedience to the same law, fifteen or twenty years. Thus living longer than the female, being six times as strong and heavy, he is the most eminent of all polygamists known to the brute world. Why should he fight six weeks or two months, uninterruptedly, a succession of bloody battles with his own kind, if the younger seals could reach his wives in the water? No; the cows land to give birth to their young, and they must be on that land to receive the effectual fecundation of their kind. Let no man be deceived, therefore, in looking over the myriads of hundreds of thousands of young males seen every season up here, and think that the battles of the old "seecatchie" are matters of brutal pomp and circumstance, so far as the reproduction of their race is involved. Let that man look well to the conditions of the males on these breeding-grounds, and the females with them, if he would regard intelligently the condition of the seal-life for the present season, and its prospect for the future.

FIGHTING: OLD AND YOUNG MALES.—The males under six years of age, although hovering about the sea-margins of the breeding-grounds, do not engage in much fighting there; it is the six and seven year-old males, ambitious and flushed with their reproductive consciousness, that swarm out and do battle with the older ones on these places. The young male of this latter class is, however, no real match for a fifteen or twenty-year-old bull; provided, that the aged "seecatchie" retains his teeth; since, with these weapons, his relatively harder thews and sinews give him the advantage in almost every instance, among the hundreds of combats which I have witnessed. Those trials of strength between the old and the young are incessant until the rookeries are mapped out; and by common consent the males of all classes recognize the coming of the females. After their arrival and settlement over the whole extent of the breeding-grounds, about the 15th July at the latest, very little fighting takes place.†

ONLY ONE PUP BORN AT TIME OF PARTURITION.—Touching the number of young born, at a birth, the most diligent inquiry and scrutiny of observation on the rookeries has satisfied me that it is confined to a single pup.

* *i. e.*, nullible-female.

† It has been suggested to me that the exquisite power of scent possessed by these animals enable them to reach the breeding-grounds at about the place where they left them the season previously; surely the nose of the fur-seal is endowed to a superlative degree with those organs of smell, and its range of appreciation in this respect must be very great.

"In carnivorous quadrupeds the structure of the bones of the nasal cavities is more intricate than in the herbivorous, and is calculated to afford a far more extensive surface for the distribution of the nerve. In the seal this conformation is most fully developed and the bony plates are here not turbinate, but ramified, as shown in the wood-cut. Eight or more principal branches rise from the main trunk, and each of these is divided and subdivided to an extreme degree of minuteness, so as to form in all many hundred plates. The olfactory membrane, with all its nerves, is closely applied to every plate in this vast assemblage, as well as to the main trunk and to the internal surface of the surrounding cavity, so that its extent cannot be less than 120 square inches in each nostril. An organ of such exquisite sensibility requires an extraordinary provision for securing it against injury, and nature has supplied a mechanism for the purpose, enabling the animal to close at pleasure the orifice of the nostril." [Harwood: *Comp., Anat., and Physiol., Bridgewater Treatise*, vol. ii, p. 402.]

I noticed in all sleeping and waking seals that the nasal apertures were never widely expanded; and that they were at intervals rapidly opened and closed with inhalation and exhalation of each breath; the nostrils of the fur-seal are, as a rule, well opened when the animal is out of water, and remain so while it is on land.

The distances at sea, away from the Pribylov islands, in which fur-seals are found during the breeding-season, are very considerable, scattered records have been made of seeing large bands of them during August as far down the northwest coast as they probably range at any season of the year, viz, well out at sea in the latitude of Cape Flattery, 47° to 49° south latitude. In the winter and spring, up to middle of June, all classes are found here spread over wide areas of the ocean; then, by the 15th June they will have all departed, the first and the latest, en route for the Pribylov islands. Then, when seen again in this extreme southern range, I presume the unusually early examples of return, toward the end of August, are squads of the yearlings of both sexes, for this division is always the last to land on, and the first to leave, the seal-islands, annually. Also, the two-year-old females which have been covered on the breeding-grounds, during June and July, undoubtedly stray back to sea, and down again from the Pribylov group, very early in August, some of them as far as the coast-heads of Fuca straits; at least, many of them at one time are never seen massed on the rookeries, and as they do not consort with the "holluschickie" and yearlings on land, quite a number of their large aggregate doubtless make frequent and extended fishing excursions during the height of the breeding-season.

If they have twins, I have failed to discover a single instance of that character. I also failed to notice a malformed pup or a monster anywhere among the multitudes under my observations, from July until the middle of November every season. I think this somewhat noteworthy, as it presents, perhaps, better than any other exhibition in the animal kingdom, the survival of the fittest in the struggle for existence; for these bulls, by their own evolution, permit only the strongest and most perfect of their kind to stamp their impress on the coming generations.*

20. REPRODUCTION OF THE SEA-LION.

REPRODUCTION OF THE SEA-LION (*Eumetopias Stelleri*).—The remarks which I have just made descriptive of the generative organs of the fur-seal, apply to those of the sea-lion, with this exception, that the male *Eumetopias* is an animal twice the size and bulk of the male *Callorhinus*. The female *Eumetopias* is not nearly so small in physique, when compared with the male of her kind, as is the female *Callorhinus*—she is fully half the stature and weight of the male. They, too, land for birth and copulation precisely as the fur-seal does, only they are few and scattered as to numbers, much more timid, and difficult to observe. The *minutia*, however, of gestation, fecundation, and the birth of their young, so far as I could see, is simply that of the fur-seal, and nothing more; although I believe that the young sea-lion takes to the water earlier and freer than the young fur-seal, of which I have spoken at length heretofore. Perhaps it is quickened for this pelagic preparation by the excessive timidity of its nature, though, as a pup, like the fur-seal, it is stolid and indifferent to man; but when it appears the coming season, as a yearling, its apprehension and fear are in marked contrast with that comparative disregard of our presence, manifested by the yearling fur-seal.

SCRATCHING SEALS MISTAKEN FOR COITION.—The coition of the sea-lion, like that of the fur-seal, is very violent, and long sustained. Even the sluggish natives, familiar as they are with this feature in the great swarm of animal life surrounding them, will always pause, sit down, and wait, if they detect this animal preparatory to and during the process of generation. At a little distance from them, on the deck of a vessel, the vibratory motion of their flippers, the bobbing or quivering of their shoulders just protruding as they expose themselves above the water, suggests to the mind of the superficial observer the act of copulation; when, in fact, the seals are as far from that performance as can be well imagined.†

21. REPRODUCTION OF THE WALRUS.

REPRODUCTION OF THE WALRUS (*Odobenus obesus*).—As I have enjoyed remarkable advantages to study herds of those old walrus which repair to Walrus islet, adjacent to St. Paul, it makes me unhappy to think that among their number I had no view of the females or their young; the latter, for some good reason or other, never consorting with the former at this place. At least the natives assured me that in all their experience, and that of their ancestry, they never found a female there. I am told, however, when the eggging-party from St. Paul made its regular annual journey to this walrus rock, during the last season, several females were found and one was shot, the first examples of their sex seen in this locality; hence, I am unable to give any information as to the reproduction of these animals. I wish, however, only to call attention to the remarkable and extraordinary development of the male organs of this animal, so closely allied to the *Otariidae*. For instance, in order that I may be understood, the male walrus, when fully grown in length, though nearly as thin osteologically and morphologically, as the sea-lion, possesses an immensely greater girth and relatively increased weight; but the penis of the walrus has an enormous bone for its foundation, nearly two feet in length, with a transverse diameter at its base of almost three inches, tapering slightly to a point, where it ends in a rough, bony nodule, over an inch in diameter.

* A trained observer, Kumlein, who passed the winter of 1877-78 in Cumberland sound, and, speaking of this feature in the Ringed Seal (*Phoca fasciata*), says "there is usually but one young at a birth; still twins are not of rare occurrence, and one instance came under my observation where there were triplets; but they were small, and two of them probably would not have lived had they been born." [Ludwig Kumlein: *Bulletin U. S. National Museum*, No. 15, p. 58, Washington, 1879.] I quote this explicit statement in this connection, because the female generative organs in the *Otariidae* do not differ to any sensible degree from those so well known in the *Phocidae* of that sex, though there is a very marked differentiation between the procreative organs of the males. Hence, it would seem only natural for twins to be born of fur-seal mothers; and, very likely it does repeatedly take place on the rookeries of the Pribylov islands, in spite of my failure to detect the result. I have personally witnessed the parturition of hundreds of fur-seal mothers, never seeing more than one pup born to each mother; yet, when a million are born here at simultaneous intervals between the 14th of June and the 20th of July every year, as a rule, my record is too slight numerically for authoritative settlement of the question. I commend its further investigation to the resident agents of the Treasury Department and the Alaska Commercial Company. It is an interesting and highly important subject for careful study and determination—no other single inquiry is more so.

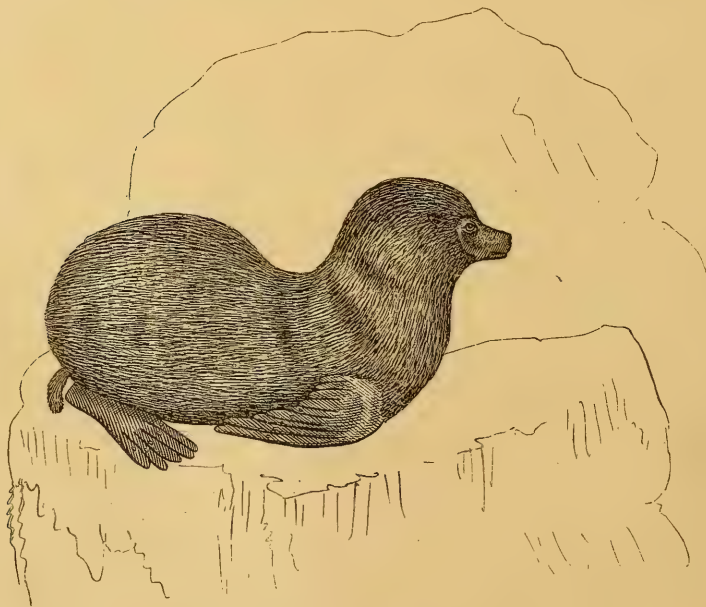
† The fur-seal and sea-lion are both sorely annoyed by a species of tick or louse—a *Pediculus*—which infests those small semi-haired spots back of the ears and within the armpits of their fore-flippers; they spend a very large portion of their time, while on land, and even in the water, by scratching these vermin. This action on land is precisely effected, and enjoyed, as our dogs do when exterminating fleas: the hind-flippers are used to reach all parts of the seal's body anteriorly; while the fore-flippers are rubbed over the small of the back with great unction. While in the water, however, the seal scratches itself more with its fore-hands; and in thus rubbing itself, half or almost wholly submerged, the bobbing of its back and hind-flippers above the surface has given rise to the erroneous idea of pelagic coition.



A FUR-SEAL, as drawn by C. Landseer, 1848.

"O. nigra—Black Otary." [Encyclo. Metropolitana, London, 1848, Fig. 2, pl. ix, p. 109]

[Evidently drawn from an alcoholic or air-dried specimen of an *Arctocephalus* pup, in its black natal coat.—H. W. E.]



THE FUR-SEAL.

(*Callorhinus ursinus*.)

[Fac-simile of a figure engraved on steel from a drawing by Sidney Edwards based upon Steller's description, published as "*Phoca ursina*" in the Book of Nature, vol. i, pl. 53, Phila., 1834. This is, in its aggregate, one of the best figures of the Fur-seal given to the world prior to my life-studies on the Pribylov Islands, 1872-76, inclusive.—H. W. E.]

This is an instrument, when padded with the fleshy muscular integuments peculiar to it, that renders the armature of the sea-lion positively insignificant by way of comparison. Like the sea-lion, the swollen testicles are external, though bunched and carried similar to those which we see on boars—not pendant. In closing the subject, I may fitly call attention to an extraordinary feature of the walrus, and suggest that in the vicinity of Bristol bay and south of Nunivak island, some two or three hundred miles to the eastward and southward of the place where I have observed this animal, I am told that female walruses breed in large herds, accompanied by the males, as well as further to the north, where they are said to be most numerous, bearing their young on the ice-floes above Bering straits. If it be true, in regard to the reproduction of the walrus in the neighborhood of Bristol bay, it is important, for here is a practicable point for an intelligent observer to establish himself, from which to take cognizance of the life and habits of this long-known though indifferently understood animal.

DO THESE SEALS DRINK?—One word in conclusion. Returning to the seal-grounds, I have noticed whenever a female seal was startled, or a herd of “holluschickie” stirred up by myself, that, in struggling to get out of my way, they voided considerable urine; and, indeed, they all eject urine when excited, while some of them, here and there, passed small masses of their peculiar soft excrement, which is like that dropped by calves soon after birth. Their incessant pattering over the hauling-grounds wipes up all traces of these excrementitious droppings, so that unless one looks closely he will not notice the fact. The old males, when landing in spring, and during their battles also, void a great deal of urine, but little or no excrement. That the seals drink or need fresh water, I doubt; but they cool their mouths incessantly by swimming with them wide open through the waves, laving as it were their hot throats and lips in the flood.*

I. ILLUSTRATIVE AND SUPPLEMENTAL NOTES.

22. THE RUSSIAN SEAL-ISLANDS, BERING AND COPPER, OR THE COMMANDER GROUP.

EXTRACTED FROM PROFESSOR NORDENSKIÖLD'S REPORT IN REFERENCE TO BERING ISLAND.

[Translated by Capt. G. Niebaum.]

ARRIVAL OF NORDENSKIÖLD: LOCATION OF BERING ISLAND.—The *Vega* anchored on the 14th August, 1879, in a rather poor, open harbor on the northwest coast of the island. Bering island is the most westerly of the Aleutian islands, and is situated nearest Kamtchatka; it does not belong, nor does the neighboring Copper island, to America, but to Asia, and is controlled by Russia; nevertheless, the American Alaska Company have obtained the hunting privilege, and maintain here a not inconsiderable trading-station, which consists of about 300 inhabitants, supplying them with provisions and manufactured goods, and from them in turn receiving their labor, principally rendered in taking skins of the eared-seal, or sea-bear (*Otaria ursina*); between 40,000 and 100,000† of

* “Do these seals drink?” is a question doubtless often uppermost and suggested to the observer's eye, as he watches those animals going to the water from the hauling-grounds and the rookeries; at least it was in mine. I never could detect *Callorhinus* or *Eumetopias* lapping, neither in the fresh-water pools and lakes, nor in the brackish lagoon, or the sea; but it plunges at times into the rollers with its jaws wide open as it dives, reappearing quickly in the same manner to dip, and rise again, many times in rapid succession as it swims along, the water running in little streams from the corners of the open mouth whenever the head pops above the surface. Whether this action was simply to cool itself, or that of drinking, I am not prepared to assert positively. I think it was to meet both purposes of refrigeration and of satisfying thirst.

Nothing passes from the bowels or the urinary organs of these old males after they have hauled out, except their soft, paste-like feces and that urine voided within the first forty-eight hours since landing. The “holluschickie”, however, and the females give frequent evidence of the regular movement of their digestive and secretive organs in this manner, throughout the whole period of their visit to the islands, especially so when they are suddenly started up to travel over the hauling-grounds to the slaughtering-fields.

† These figures are in error; the table given at the close of this translation will show it. It is well known that the fur-seal, as it bred, was first seen and described by Steller, who wrote his description on this island, when shipwrecked there with Bering, in 1741–42. Steller's account and the stories of the survivors drew a large concourse of rapacious hunters to the Commander islands; they appear, as near as I can arrive at truths, from the scanty record, to have quickly exterminated the sea-otters, and to have killed many and harassed the other fur-seals entirely away from the island; so that there was an interregnum between 1760 and 1786, during which time the Russian promyshleniks took no fur-seals, and were utterly at loss to know whither these creatures had fled from the islands of Bering and Copper. When they (the seals) began to revisit their haunts on the Commander islands, I can find no specific date; but I am inclined to believe that they did not reappear on Bering and Copper islands to anything like the number seen by Steller, until 1837–38; perhaps have not done so until quite recently. At least, in 1867, the Russians did not think more than 20,000 skins could be secured there annually, while they declared 100,000 could be taken readily at the Pribylovs; again, since 1867 the capacity of the Commander group has gradually increased from 15,000 to 20,000, then to 40,000 and 50,000 “holluschickie” per annum. Now, this striking improvement is due, doubtless, to the superior treatment of the whole business by the Alaska Commercial Company, which had also leased these interests from the Russian government in 1871 for a term of 20 years. I think, therefore, that when the fur-seals on the Commander islands became so ruthlessly hunted and harassed shortly after Steller's observations in 1742, then they soon repaired, or rather most of the survivors did, to the shelter and isolation of the Pribylov group, which was wholly unknown to man; and it remained so until 1786–87. Then succeeded a period between, up to 1842–45, when the unhappy seals had but little rest or choice between the Commander and the Pribylov islands, and must have sadly diminished, as the record shows, in numbers.

The unfortunate overland journey of Steller, which alternately starved and froze him into a low fever that ended his young and promising life in a yourt on the Siberian steppes, November 13, 1745, six years prior to the first publication of his celebrated notes on the

these animals are killed yearly on this and the neighboring Copper island; those are the animals from which is obtained the brown, silky, soft seal-skin, which of late has become so fashionable. In order to watch over the interest of the Russian government and to maintain order, there are also a few Russian officers stationed here.

SKETCH OF THE VILLAGE.—A half dozen convenient wooden houses are here erected, used for warehouses and stores, also for the use of servants of the Russian government and of the company. The natives live partly in adobe houses, quite roomy and not unpleasant inside; partly in small wooden houses which the company are gradually endeavoring to introduce, instead of turf houses, by yearly importing and giving away a few such houses to the most deserving ones of the inhabitants. A church for Greek-Catholic service is also there, and a roomy school-house intended for children of the Aleutians. Unfortunately, the school was now closed, but to judge from the copy-books which were lying around in the school-room, the teaching here is not to be despised. At least the writing proofs were conspicuous for their cleanliness, absence of school blots, and an exceedingly even and beautiful handwriting. At the "colony" the houses are collected in one place in a village, which, from the sea, has the appearance somewhat of a small Norwegian fisherman village. Beside these, a few scattered houses are to be found here and there on other parts of the island, as, for instance, on the northeast side, where cultivation of potatoes is carried on on a small scale, at the hunting-place on the north side, where a couple of large warehouses and a number of very small underground houses are to be found, and are used only during the killing-season.

DISCOVERY OF THE ISLAND.—Geographically, as well as in regard to natural history, Bering island is one of the most curious islands in the northern part of the Pacific ocean. It was here where Bering, after his last disastrous voyage in this sea, which now bears his name, on the 19th of December, 1741, finished his long career as a discoverer, shortly after his ship, during a storm, crushed against the cliffs on the north coast of the island. Many of his fellow-travelers survived him, among them the learned naturalist Steller, who left a masterly description, seldom equaled, of the natural history of this island, where he involuntarily spent his time from the middle of November, 1741, to the end of August, 1742.

As far as is known, Bering island had never before been visited by man. It was the desire to obtain for our museums the skins and skeletons of the many curious mammiferous animals existing here, as also to compare the present condition of the island, since it has nearly a century and a half been mercilessly exposed to hunting and the cupidity of mankind, with the vivacious and striking description left by Steller, which prompted me to put down on our traveling plan a visit to the island. The news I gathered on Bering island from American papers, about the uneasiness which our wintering in the Arctic had created in Europe, really prevented me from remaining here as long as I should have wished; but, nevertheless, our collections and observations are exceedingly valuable.

CHANGES SINCE STELLER'S TIME.—Since the time of Steller, the animal life has undergone a considerable change on the island. Foxes (or, more correctly, "fjellrackor", Swedish) existed then in unusual numbers. Not alone did they eat up everything that could be eaten at all which was left outside, but they forced themselves in the houses during the day as well as night, and carried away anything they could, even articles that could be of no use to them, such as knives, sticks, sacks, shoes, and socks. It became necessary, when doing certain things out of doors, to drive them away with sticks, and at last they became—through the slyness and cunning with which they managed to consummate their thieving, and the cleverness with which they combined their efforts to attain objects which they alone could not accomplish—really dangerous, mischief-making animals for the castaways. Since then thousands upon thousands have been taken here by fur-hunters. Now they are so rare that during our stay here we did not see a single animal. The remaining ones are said not to have the formerly so commonly-seen black-blue coat, but the white, which is not very costly. On the neighboring Copper island there are still considerable numbers of black-blue foxes.

Steller and his fellow-travelers killed here in 1741-42, seven hundred sea-otters. This animal, known for its very costly and fine fur, is now entirely driven from Bering island.

Of sea-lions, *Otaria Stelleri*, which were formerly very numerous, but few now visit this place; also sea-bears, *Otaria ursina*, and finally, the most curious of all the former mammalia on Bering island, the great sea-cow, is now altogether extinct.

MARINE "NEAT CATTLE."—Steller's sea-cow, *Rhytina Stelleri*, took the place, in a certain way, of the hoofed animal among the sea-mammalia. It was of a nut-brown color and covered with hair which had grown together into an outer hide, much like the bark of an old oak tree. Its length was, according to Steller, even to 35 feet, and its weight almost five hundred hundred weight. The head was large, neck short, hardly distinguishable, forepart of body very thick, but suddenly narrowing backward. It had two short fore-legs, which terminated abruptly without any fingers or nails, but with close-gathered bristle hair; hind-legs were missing altogether and replaced by a tail-fin, something like the whale. Teats, which were very rich in milk with the females, had their places between the forelegs. The flesh and milk resembled very much that of neat-cattle; it was even better than the latter, according to Steller.

"sea-bears" of Bering island, often occurs sadly to my mind in this connection; for, undoubtedly, had he lived then to have reached St. Petersburg, whither he was bound, he would have enlarged and polished these items, which now appear in the *Proceedings of the Imperial Academy*, 1751, just as he had roughly drafted them in the field, May and June, 1742. This revision of his field jottings would have undoubtedly supplied many links now missing to the disconnected history of the seal-life on the Commander islands, as it presents itself to us at this late day.—H. W. E.

The sea-cows were almost constantly occupied in feeding on those sea-weeds found in abundance along the coast, in doing which they moved neck and head as an ox. They showed great gluttony, and were not disturbed in the least by the presence of people. It was possible to go up to and even to touch them without their being scared or seeming to mind it. Toward each other they showed great affection, and when one was harpooned the others made unusual efforts to save it.

When Steller was there these animals collected in great herds as neat-cattle, grazing everywhere along the shores. A great number were killed by Steller and his companions. Later the hunt for these animals was an important food-item for those Russians who sailed from Kamtchatka to the Aleutian islands. Hundreds were killed yearly, and it was soon exterminated, as it existed, if we except a few animals gone astray, at that time only on Bering island. According to what Middendorf quotes from the very careful researches which the celebrated academicians v. Baer and v. Brandt had made, the sea-cow had not been seen before Steller's time, 1741, and the last was said to have been killed in 1768. During the many investigations I made among the natives, I obtained reliable information that the sea-cow had been killed much later. A "creole" (*i. e.*, a mixture of Russian and Aleut), who is now sixty-seven years old, of clever appearance and perfect mental condition, said that his father died in 1847, aged eighty-eight. The father was from Wollhynien, and came to Bering island when eighteen years of age, that is, in 1777. The first two or three years (that is, 1779 or 1780) after his arrival, they used to kill sea-cows as they grazed at low-water mark. Only the heart was eaten; the hide was used for badarrahs. In consequence of its thickness it was split in two parts. Two such split hides were sufficient to cover a badarra of 20 feet length, $7\frac{1}{2}$ feet width, and 3 feet depth. After that time none of these animals had been killed.

LAST SIGHT OF SEA-COW HERE.—It is surmised that a sea-cow had shown itself much later around the island. Two "creoles", Teodor Merchenin and Stepproff, saw, about twenty-five years ago, at Tolstoi Mees, on the east of the island, an animal which they did not know; it was very thick forward and tapered backward, had small fore-feet, and showed itself about 15 feet above the water, rising and again sinking. It blew, not through a blow-hole, but through its mouth, which was somewhat elongated. Its color was brown, with large light spots. It had no fin on the back, but when it raised itself it was possible to see the vertebral lumps, in consequence of its very lean condition. I made a very thorough examination of the two tales-men. Their story agreed fully, and appeared as if entitled to be given credence.

One of the Alaska company's hide-examiners, Mr. Ohsche, a native of Liffand and for the present living on Copper island, told me that bones of the sea-cow could be found on the west side of Copper island, in the center. Again, it is said that no bones exist on the little islet, opposite the colony, although bones are plenty on the neighboring beach on the main island. This is the meager information I could gather from the natives and other people residing here about the animal. But I was very fortunate in being able to collect a very large and beautiful assortment of skeleton parts.

NORDENSKIÖLD'S SUCCESS IN GETTING ITS BONES.—When I first made the acquaintance of the Europeans living on the island, I was told that there was a very poor show for making any large collections. The company had in vain offered 150 rubles for a skeleton. But after I had been ashore a few hours I already found out that larger and smaller collections of bones were to be found here and there in the huts of the natives. Those I bought, paying purposely for them in such a way that the seller was more than satisfied, and his neighbor a little envious. A large portion of the male population now commenced very zealously to hunt for bones, and in this manner I got together twenty-one casks, large boxes, and barrels full of *Rhytina* bones, among them many very extensive bone-collections from the same animal, two whole, very pretty, and several more or less damaged skulls, etc.

BONES OF THE EXTINCT SEA-COW OF STELLER.—*Rhytina* bones are not lying near the water-edge, but on a beach-shelf, 6 to 10 feet high, thickly covered with grass. They are usually covered with a layer of earth *débris* of 1 to $1\frac{1}{2}$ feet thickness, and in order to find them we had to explore the ground with a bayonet or a sharp iron, as it would have been too laborious to dig up the whole grass layer. A person very soon gets accustomed to distinguish, by the sound or the feeling of the bayonet, whether he has struck against a stone, a piece of wood, or a piece of bone.

In consequence of their hard ivory-like condition, the *Rhytina* bones are used by the natives for sleigh-runners and for carvings. They are, therefore, already to a great extent used up and rarer than other bones. The bones from the finger seem in most cases to be entirely destroyed, and the same is the case with the extreme tail-parts.

FUR-SEALS ON BERING ISLAND.—The only large animal which still exists on the island, in perhaps as large numbers as at the time of Steller, is the sea-bear, *Otaria ursina*. Even that had decreased so that the yearly catch was a very inconsiderable one, when the Alaska Company obtained the exclusive privilege for hunting, by a payment to the Russian government of, if I remember right, two rubles for each animal killed. The hunting was then organized on a more advantageous basis. At certain periods of the year the animals are now altogether unmolested. The number of animals to be killed is settled beforehand, just the same as the farmer in the fall of the year (slaughtering-time, Swedish custom) is in the habit of doing with his cattle. After that is done, the animals condemned to death are selected as well as can be done in a hurry, but animals with poor skin, old females and pups, are liberated. Those numerous flocks of sea-bears, which are found on the shores of Bering and Copper islands, are consequently handled nearly the same as a herd of tame animals. This can only be done in that manner, because

the animals are in the habit of spending several months of the year, almost without interruption* and without eating any food, on certain long, rocky spits running out into the sea from those islands. They congregate here in hundreds of thousands, in closely packed flocks on the beach. On those places it is strictly prohibited to hunt the animal or to disturb it during its rest, without special permission from the village foreman, who is selected by the Aleuts living in the place. When a number of sea-bears are to be killed, a flock is surrounded by a sufficient number of hunters and are driven with sticks up on the grass a short distance from the beach. Then females and young ones, and those males whose fur-coat is not desirable, are driven away. The remaining ones are stunned first with a blow on the nose, and then stabbed with a knife.

INSPECTION OF A ROOKERY.—Accompanied by the village foreman, a black-haired stuttering Aleut, and the "Cossac", a young, neat, and polite man, who on special occasions carries a saber of nearly his own length, but who otherwise not in the least answered to the Cossac type accepted by writers of novels and dramas, a few of us visited a spit sticking out in the sea from the north side of the island, which is a favorite resting-place for sea-bears. Just at that time there were, in accordance with surely overestimated statements which we received, 200,000 animals congregated at the spit and neighboring beaches. Accompanied by our guides we received permission to crawl close on to a flock lying a little separate. The older animals were a little uneasy at first, when they noticed that we crawled near them, but they very soon settled down again, and we now had the pleasure of a peculiar spectacle. We were the only spectators. The scene consisted of a stone-covered beach wreathed with foaming breakers, the background of the unmeasurable sea, and the actors thousands of curiously-formed animals.

A number of old males were lying still and immovable, unconcerned about what went on around them. Others crawled on their short, small legs clumsily among the rocks on the beach, or swam with incredible suppleness among the breakers, playing, cooing with each other, and quarreling. In one place two older animals fought with a peculiar wheezing noise, in a manner as if the fighting had taken place with studied positions for attack and defense. In another, a sham fight between an old animal and a pup. It appeared as if that one was receiving lessons in the art of fencing. Everywhere the little black pups were crawling friskily to and fro between the others, now and then bleating like lambs calling their mothers. Often the pups are crushed by the old, when scared by some untoward circumstance they rush out in the sea. Hundreds of dead pups are found after such an alarm on the beach.

"Only" 13,000 animals had been killed this year. Their skinned carcasses were lying heaped in the grass on the beach, spreading a disagreeable smell far and wide, which after all did not scare the comrades lying on neighboring points, because among them a similar smell prevailed on account of the many dead animals remaining on the beach, either crushed or dead from natural causes. Among this large herd of sea-bears a single sea-lion was enthroned on top of a high rock, the only one of those animals which we had seen during our travel.

Against payment of 40 rubles I prevailed on the village chief to prepare for me four skeletons of those half rotten carcasses lying in the grass, and afterward I received, through the kindness of the Russian authorities and without any compensation, for stuffing, six animals, among them two live pups. Even those we had to kill, after in vain having tried to make them take food. One of them will be brought home, in alcohol, for anatomical investigation.

CHARACTER OF BERING ISLAND.—That part of Bering island which we saw is composed of a plateau resting on volcanic mountains,† which in many places is broken by deep cañons. In their bottoms are usually found lakes, which through smaller or larger streams connect with the sea.

The border of the lakes and the mountain slopes are covered with a rich vegetation of long grass and beautiful flowers, among which a sword lily, that is cultivated in our gardens, the useful dark-red brown Savannah lily, several orchids, two kinds of rhododendrons, large flowers, umbellifers the height of a man, sunflowers like *synanthus*, etc.

An entirely different kind of flora prevailed on the islet which lies outside the harbor.

Toporkoff islet consists of an eruptive rock, which everywhere toward the shores, a few score yards from high-water mark, rises up in the form of abrupt, low, cracked walls from 5 to 10 meters in height, differing in different places. Above those abrupt mountain walls the surface of the island is formed of an even plane; what lies below, forms a gradually sloping beach.

The gradually sloping beach consists of two well-defined belts, an outer one without any vegetation, an inner one overgrown with *Ammadenia peploides*, *Elymus mollis*, and two kinds of umbellates, *Heracleum sibiricum* and *Angelica archangelica*, of which the two last named form an almost impenetrable brush, about 50 meters wide, man high, along the shelf.

The abrupt mountain walls are in some places yellow-colored from the *Caloplacmus murorum* and *C. cremulata*, in other places quite closely clothed with *Cochlearia fenestrata*.

* During a long continued heavy rain many of the animals are said to seek shelter in the sea, but return as soon as the rain ceases.

† According to Mr. Greboritsky, tertiary petrifications and seams of coal are found on Bering, the former north of the colony in the interior of the island, the latter at the water's edge south of Bering's grave. Also, near the colony, the underlayer below trachyte beds is composed of immense sand layers.

The uppermost even plateau is covered by a luxuriant close grass-carpet, over which a few stalks of the two above-named umbellates raise themselves here and there.

Vegetation on this little islet combines an unusual poverty of various species with a high degree of luxuriance.

Of higher order of animals we saw only four species of birds, namely, *Fratercula cirrhata*, *Uria grylle*, one species of *Phalacrocorax* (Swedish skafvar), and one kind of the gull (*Larus*) species, which live here by the millions. They occupied the upper plateau, where they had everywhere dug out short, deep, and unusually broad passages, with two openings, in which they slept. From there they flew, on our arrival, in large flocks to and from the sea. Their numbers were almost comparable with the auks on the Arctic bird cliffs. The other ducks nestled along the shore cliffs.

The number of the non-vertebrate land-animals foots up perhaps to thirty species. The most numerous are *Machelis*, *Vitrina*, *Lithobias*, *Talitrus*, a few two-winged beetles (bugs). They all lived on the inner belt of the shore, where the ground is unusually damp.

MUCH Milder climate than that of the Pribylov group.—Bering island could, without difficulty, feed large herds of cattle, perhaps as numerous as the herds of sea-cows which formerly grazed along its shores. The sea-cow had, as it were, chosen its grazing place with discrimination, because the sea about here, according to Dr. Kjelman, is one of the richest kelp-places in the world. The bottom of the sea is covered, in favorable places, with kelp forests, from 60 to 100 feet high, which are so dense that the scraper with difficulty penetrates down in them, a circumstance which made the dredging exceedingly difficult. Certain kind of kelp is used by the inhabitants for food.

SALMON ON THE ISLAND.—That spit, where the sea-bears have their rookeries, is about 20 kilometers distant from the village. We went there each on his sleigh drawn by about ten dogs. During this trip, at a resting-place half-way between the village and the rookeries, we had occasion to take part in a very peculiar fishing. Our halting-place was on an even grass meadow, cut through by innumerable brooks. Those were full of various kinds of fishes, among them a kind of siik (gwiniad, Swedish), a small trout (forell), a medium-sized salmon, with almost white meat, but with purple-red skin, and another of about the same length, but very broad and with a hump on the back. These were easily taken. They were taken by hand, harpooned with an ordinary blunt stick or any piece of wood, cut with knives, or taken with a bug-scoop. Other kinds of salmon, with very highly colored red flesh, are found in the larger streams on the island. We received here, for a mere nothing, a welcome change from the preserved food with which we had long ago become thoroughly disgusted.

COURTESY OF THE ALASKA COMMERCIAL COMPANY.—Beside that, the expedition received, as a gift from the Alaska Company, fat and splendid beeves, milk, and other refreshments, and I cannot sufficiently praise the good-will we experienced, as well from the Russian official, Mr. Greboritsky, an energetic and skillful student of natural history, as from the employés of the Alaska Company, and all other persons living on the island with whom we came in contact. [Translation closes.]

TABLE SUBMITTED BY THE AUTHOR, SHOWING THE "CATCH" ON THE COMMANDER ISLANDS.—In order to show the relative importance of the seal business on these Russian islands as compared with that of our own, I append the following exhibit of what has been done there since 1862. Professor Nordenskiöld does not seem to have gathered the information; he has, however, in his forthcoming *Vegås-fürden*, embodied my figures:

Fur-seal skins taken for shipment from the Commander islands.

Years.	Number of seals taken.	Years.	Number of seals taken.	Years.	Number of seals taken.
1862.....	4,000	1869.....	24,000	1876.....	26,960
1863.....	4,500	1870.....	24,000	1877.....	21,532
1864.....	5,000	1871.....	3,614	1878.....	31,340
1865.....	4,000	1872.....	29,318	1879.....	42,752
1866.....	4,000	1873.....	30,399	1880.....	48,504
1867.....	4,000	1874.....	31,272		
1868.....	12,000	1875.....	36,274	Total, 1862 to 1880.....	387,402

BERING'S DISASTER.—The miserable ending to Bering's voyage of discovery in 1741-42 had one redeeming clause—the shipwreck of the commander's vessel gave Steller his opportunity of making the fur-seal rookeries known to man for the first time, in either history or legend. As the prime factor of this entertaining addition to our knowledge, I think a short recital of the misfortunes of the Russian expedition interesting in the relation which it bears to the subject of my discussion.

HOMEWARD VOYAGE AND SHIPWRECK.—In 1741, June 4, Bering and Tschericov set sail from Petropavlovsky, in two small vessels, the "St. Peter" and the "St. Paul"; they proceeded as low as the 50° latitude, then decided to steer eastward for the reported American continent. On the 20th the rude ships were separated by a storm, and the two commanders never met in life again. Sunday, 18th July, Bering, while waiting for the other vessel, drifted on our northwest coast. He passed some six weeks in the new waters of his discovery, when by the 3d of September

a violent storm occurred and lasted seven days, driving them back to 48° 18' north latitude, and into the lonely wastes of the vast Pacific. The scurvy began to appear on board; hardly a day passed without the death of one of the crew, and men enough in health were scarcely left to manage the ship. A return to Kamtchatka was resolved upon. Bering became morose and seldom appeared on deck, and the second in command, Stoörman Vachtel, directed the dreary cruise. After regaining the land, and burying a sailor named Shumagin on one of the group of Alaskan islets that bear this title to-day, and discovering and naming several Aleutian capes and islands, they saw two, which by an unfortunate blunder, they took for the Kuriles and adjacent to Kamtchatka; thus they erred sadly in their reckoning and sailed out on a point of false departure. In vain they craned their necks for the land—the shore of Kamtchatka refused to rise, and soon there was no hope of making a port in that goal so late in the year. The wonderful discipline of the Russian sailors was strikingly exhibited at this stage of the luckless voyage; notwithstanding their fearfully debilitated condition, and suffering from cold and wet, they obeyed orders and attended to their duties. We are told by Steller that the scurvy had already so far advanced that the steersman was conducted to the helm by two other invalids who happened to have the use of their legs, and who supported him under the arms; when he could no longer steer from suffering, he was succeeded by another no better able to execute the labor than himself; thus did the unhappy crew waste away into death; they were obliged to carry few sails, for they had not hands to reef them, and such as they had were nearly worn out, and in this case they could not be replaced from the stores, since there were no seamen strong enough on the ship to bend new ones to the yards and booms.

Soon rain was followed by snow, the nights grew longer and darker, and now they lived in dreadful anticipation of shipwreck; the fresh water diminished, and the labor of working the vessel became too severe for the few who were able to be about. From the 1st to the 4th November the ship had lain as a log on the ocean, helpless, and drifting at the sport of the wind and the waves. Then, again, they managed to control her, and set her course anew to the westward, without knowing absolutely anything as to where they were. In a few hours after, the joy of the distressed crew can be better imagined than described, for they saw the tops of high hills, still at a great distance ahead, covered with snow. As they drew nearer, night came upon them, and they judged best, therefore, to keep out, "off and on," until daybreak, so as to avoid the risk of wrecking themselves in the dark. In the morning they found that the rigging on the starboard side of the vessel was giving way, and the craft could not be managed much longer; that the water was very low, and the sickness increasing frightfully. The humidity of the climate was now succeeded by intense cold; life was well-nigh insupportable on ship then, and they determined to make for the land to save their lives, and, if possible, safely beach the "St. Peter".

The small sails were alone set; the wind was north; the depth of water 36 fathoms, sand bottom; two hours after they decreased it to 12; they now contrived to get over an anchor and run it at three-quarters of a cable's length; at 6 p. m. the hawser parted, and tremendous waves bore the helpless boat through the darkness and the storm, in to the coast, where soon she struck twice upon a rocky reef. Yet, in a moment after, they had 5 fathoms of water; a second anchor was thrown out and again the tackle parted; and, while in the energy of wild despair, they were preparing a third bower, a huge combing wave lifted that ark of misery, of superlative human suffering, safely and sheer over the reef, where in an instant she lay in calm water; the last anchor was put out, and the voyage of Bering came to an end, in 4 fathoms of water, over a sandy bottom, and only 300 fathoms from the beach. In the morning they found that they had drifted in here at the only spot where they possibly could have been carried over a ridge of rocks—that 20 fathoms distance right or left of their course, high basaltic boulders and jagged pinnacles arose from the sea, against which they must have perished, had they struck during the fury of the gale and the darkness of the night.

THE EXHAUSTED RUSSIANS LAND.—Winter was now at hand; the crew, worn down with excitement, fatigue, and disease, reposed until midday, then lowered the boat; on the 6th November, Vachtel landed. They found the country barren and covered with snow. A clear stream of excellent water, not frozen, ran down from the hills to the shore; no trees or even shrubs were visible; firewood was driftwood on the beaches, so it had to be dug from under snow and icy fetters; shelter there was none, but they found near the open mouth of the little creek some sand walls, and deep wind-scraped hollows therein; these they cleared out and covered over with the ship's sails, to serve as a temporary shelter until they could build a wooden cabin; on the 8th November, the sand caves were prepared and the sick taken from the "St. Peter" and placed in them. Steller, the undaunted surgeon and naturalist, tells us that some of them died on being brought up from the ward-room below, others in the boat, and others soon after landing—the violent change of air snapped the slender threads remaining that bound them to this life; the bodies of the dead were instantly attacked by foxes, *Vulpes lagopus*, which came down suddenly to their strange prey without fear, apparently never having seen man; and were so bold that they actually mangled the feet and heads of the dead Russians ere the living could bury them.

MELANCHOLY INCIDENTS OF BERING'S DEATH.—On the 9th November, Bering himself was brought ashore, well shielded from the atmosphere and put into a sand hollow all by himself; of the officers, he, alone, died; his age and temperament inclined him to inactivity; he became delirious and cunning, taking his friends to be his enemies, some of whom, including Steller, could not come into his presence during his last illness; he used to amuse himself by detaching the sand from the sides of the place where he lay, so that he soon covered his lower

limbs entirely with it; those who attended him cleared it away at first, but finally he would not suffer them to do so, and showed impotent anger while they made the attempt; when he died at last, just 30 days after being brought ashore, he was almost buried by his own hands in the sandy bed of his death; they interred him near the spot, and the island is his monument, and also the imperishable record of his singular end.

Steller says that those who survived were those who resisted the desire to take to their beds, and whose natural flow of humor kept them sanguine and cheerful; the officers who had to be on deck and up at all hours looking after everything, were never taken down seriously, though they all were attacked by scurvy. Not long after Bering died, the "St. Peter" was wrecked by a fearful southeaster; her cable parted, and she came ashore near by the Russian encampment, during the night of December 29; in the morning she was found buried 8 or 10 feet in the sand, completely shattered; this was a crushing blow to the survivors—they had counted alone on getting back to Petropavlovsky by her instrumentality.

ESCAPE OF THE SURVIVORS.—The survivors, 45 souls, lived through the winter on the flesh of sea-lions, the *Illytina* or Manatee, and thus saved their flour, etc.; they managed to build a little shallop out of the remains of the "St. Peter", in which they left this scene of the most extraordinary shipwreck and deliverance in our annals, on the 16th of August, 1742, and reached Petropavlovsky in safety on the 27th.

THE NERVE AND COURAGE OF STELLER.—Steller here saw the fur-seal breeding, first of all civilized men, in the waters north of the equator; and here he made the earliest record of its existence as an animal in the naturalist's lexicon; the rookery to and from which he used to journey in observation was nearly nine miles from the camp; and, considering his physical condition—he was never a robust man—the fatigue that his excursions must have engendered would have deterred most men from making a second trip to the "laasbustehie" of Bering island.

As our intelligence and appreciation of these valuable interests of natural science, and of commerce peculiar to the Pribylov group of Alaska and the Commander islands of Russia, increases, so does our regard and esteem for Steller advance; since he was the surgeon of that ill-fated expedition, his duties in this direction must have consumed nearly all of his time in the most imperative manner; what he did do, therefore, in the line of natural history, is still the more to be commended.

23. ST. MATTHEW ISLAND, AND ITS RELATION TO ST. PAUL.

POLAR BEARS ON THE PRIBYLOV GROUP.—When the fur-seals first took possession of the Pribylov group, they undoubtedly found polar bears thereon; at least, I firmly believe that if the bears were not about when they first arrived, it was not due to the inability of these creatures to get there in limited numbers, but rather to the fact that nothing on the islands invited them, or was as attractive as the field to the north; for this animal cannot endure with comfort a temperature which even the fur-seal will submit to.

Provided with more walrus meat than he knew what to do with, the polar bear, in my opinion, has never cared much for the seal-islands; but the natives have seen them here on St. Paul, and old men have their bear stories, which they tell to the rising generation. The last "medvair" killed on St. Paul island was shot at Boga Slov, in 1848; none have ever come down since, and very few were there before, but those few evidently originated at and made St. Matthew island their point of departure. Hence, I desire to notice this hitherto unexplored spot, standing, as it does, 200 miles to the northward of St. Paul; and which, until Lieutenant Maynard and myself, in 1874, surveyed and walked over its entire coast-line, had not been trodden by white men or by natives, since that dismal record made by a party of five Russians and seven Aleuts, who passed the winter of 1810-'11 on it; and who were so stricken down with scurvy as to cause the death of all the Russians save one, while the rest barely recovered, and left early the following year. We found the ruins of the huts, which had been occupied by this unfortunate and discomfited party of fur-hunters, who were landed there to secure polar bears in the depth of winter, when such ursine coats should be the finest.

TOPOGRAPHY OF ST. MATTHEW ISLAND.—St. Matthew island is a queer, jagged, straggling reach of bluffs and headlands, connected by bars and low-land spits; the former, seen at a little distance out at sea, resemble half a dozen distinct islands; the extreme length is twenty-two miles, and it is exceedingly narrow in proportion. Hall island is a small one that lies west from it, separated from it by a strait (Sarichev) less than three miles in width; while the only other outlying land is a sharp, jagged pinnacle rock, rearing itself over 1,000 feet abruptly from the sea, standing five miles south of Sugar-Loaf cone, on the main island. From the cleft and blackened fissure near the summit of this serrated pinnacle rock, volcanic fire and puffs of black smoke have been recorded as issuing.

Our first landing, early in the morning of August 5, was at the slope of Cub hill, near cape Upright, the easternmost point of the island. The air coming out from the northwest was cold and chilly, and snow and ice were on the hill-sides and in the gullies; the sloping sides and summits of the hills were of a grayish, russet tinge, with deep green swale flats running down into the low lands, which are there more intensely green and warmer in tone. The pebble bar, formed by the sea between cape Upright and Waterfall head, is covered with a deep stratum of glacial drift, carried down from the flanks of Polar and Cub hills, and extending over two miles of this water-front to the westward, where it is met by a similar washing from that quarter. Back and in the center of this neck are several small lakes and lagoons without fish; but, emptying into them are a number of clear, lively

brooks, in which were salmon parr of fine quality. The little lakes undoubtedly receive them; hence, they were land-locked salmon. A luxuriant growth of thick moss and grass, interspersed, existed almost everywhere on the lowest ground, and occasionally strange dome-like piles of peat were lifted four or five feet above the marshy swale, and appeared so remarkably like abandoned barrabaras that we repeatedly turned from our course personally to satisfy ourselves to the contrary.

CHANGING VEGETATION.—As these low lands ascend to the tops of the hills, the vegetation changes rapidly to a simple coat of cryptogamic gray and light russet, with a slippery slide for the foot wherever a steep flight or climbing was made; water oozes and trickles everywhere under foot, since an exhalation of frost is in progress all the time. Sometimes the swales rise and cross the hill-summits to the valleys again, without any interruption in their wet, swampy character.

LAIRS OF THE POLAR BEAR.—Here, on the highest points, where no moss ever grows, and nothing but a fine porphyritic shingle slides and rattles beneath our tread, are bear-roads leading from nest to nest, or lairs, which they have scooped out of frost-splintered rocks on the hill-sides, and where the she-bears undoubtedly bring forth their young; but it is not plain, because we saw them only sleeping, at this season of the year, on the lower ground, seemingly to delight in stretching themselves and rolling over the rankest vegetation.

GLACIAL EXHIBITS.—The action of ice in rounding down and grinding hills, chipping bluffs, and chiseling everywhere, carrying the soil and *débris* into depressions and valleys, is most beautifully exhibited on St. Matthew. The hills at the foot of Sugar Loaf cone are bare and literally polished by ice-sheets and slides of melting snow; the rocks and soil from the summits and slopes are carried down and "dumped", as it were, in numberless little heaps at the base, so that the foot of the hill, and out on the plain around, strongly put us in mind of those refuse piles which are dropped over the commons or dumping-grounds of a city. Nowhere can the work of ice be seen to better advantage than here, aided and abetted as it undoubtedly is by the power of wind, especially with regard to the chiseling action of frost on the faces of the ringing metallic porphyry cliffs.

EXTENSIVE FLORA.—The flora here is as extensive as on the seal-islands, 200 miles to the southward, but the species of *gramma* are not near so varied; indeed, there is very little grass around about. Wherever there is soil it seems to be converted by the abundant moisture into a swale or swamp, over which we traveled as on a quaking water-bed; but on the rounded hill-tops and ridge summits the wind-rubbed and frost-splintered shingle makes good walking; both of these climatic agencies evidently have an annual iron grip on the island.

FANTASTIC CLEAVAGE OF THE ROCKS.—The west end of St. Matthew differs materially from the east; the fantastic weathering of the rocks at Cathedral point, Hall island, will strike the eye of a most casual observer as the ship enters the straits going south. This eastern wall of that point looms up from the water like a row of immense cedar-tree trunks; the scaling off of the basaltic porphyry and growth of yellowish-green and red mossy lichens made the effect most real, while a vast bank of fog lying just overhead seemed to shut out from our vision the foliage and branches that should be above. This north cape of Hall island changes when approached, with every mile's distance, to a new and altogether characteristic profile.

Our visit at the west end of the island of St. Matthew was, geologically speaking, the most interesting experience I have ever had in Alaska. The geologist who may desire to study the greatest variety of igneous forms *in situ*, within a short and easy radius, can do no better than make his survey here; the rocks are not only varied by mineral colors, together with a fantastic arrangement of basalt and porphyry, but are rich and elegant in their tinting by the profuse growth of lichens, brown, yellow, green, and bronze.

HUNDREDS OF POLAR BEARS.—An old Russian record prepared us, in landing, to find bears here; but it did not cause us to be equal to the sight we saw, for we met bears—yea hundreds of them. I was going to say that I saw bears here as I had seen seals to the south, but that, of course, will not do, unless as a mere figure of speech. During the nine days that we were surveying this island, we never were one moment, while on land, out of sight of a bear or bears; their white forms in the distance always answered to our search, though they ran from our immediate presence with the greatest celerity, traveling in a swift, shambling gallop, or trotting off like elephants. Whether due to the fact that they were gorged with food, or that the warmer weather of summer subdued their temper, we never could coax one of these animals to show fight. Its first impulse and its last one, while within our influence, was flight—males, females, and cubs, all, when surprised by us, rushing with one accord right, left, and in every direction, over the hills and away.

After shooting half a dozen, we destroyed no more, for we speedily found that we had made their acquaintance at the height of their shedding season; and, their snowy and highly prized winter-dress was a very different article from the dingy, saffron-colored, grayish fur that was flying like downy feathers in the wind, whenever rubbed or pulled by our hands. They never roared, or uttered any sound whatever, even when shot or wounded.

EXCELLENCE OF THE FLESH.—Let me testify at this moment to the excellent quality of polar-bear steak; we gave it a fair trial, and it conquered all our prejudices—mine in especial, because I had been victimized with black-bear meat many years before, in British Columbia.

IMMENSE SIZE OF THE POLAR BEAR.—These bears impressed me greatly by their enormous size. One, shot by Lieutenant Maynard, measured exactly 8 feet from the tip of its nose to its excessively short tail, and could not have weighed less than 1,000 or 1,200 pounds; it had a girth of 24 inches around the muscles of the forearm

alone, at the place where the skin was removed and the foot cut off just back of the carpal joint, that corresponds to our wrist. This animal was very fat, and its head was scarred all over with wounds, evidently received in fighting with its kind. No worms were found in the intestines and stomach; the liver was speckled with light grayish-green dots, and normal. Many of them were seen grazing and rooting like hogs on a common.

FITFUL SLEEP OF BEARS.—They sleep soundly, but fitfully, rolling their heavy arms and legs about as they doze; for naps they seem to prefer little grassy depressions on the sunny hill-sides and along the numerous water-courses; and their paths were broad and well beaten all over the island. We could not have observed less than 250 or 300 of these animals while we were there; at one landing on Hall island there were 16, scampering up and off from the approach of the ship's boat, at one sweep of our eyes.

FUR-SEALS CANNOT LAND HERE.—The chief attraction to these bears, undoubtedly, at St. Matthew, is the walrus herds; and the island's special adaptation by its position to a possibility of its ever being resorted to by the fur-seal, was the reason of my visit; and, the result of my careful examination shows conclusively that the character of the gravel spits and necks which are the only landing-grounds offered, is such as not to be fit for the reception of breeding seals, as they would be speedily converted by them into a sheet of mud and slime; and there is no other ground presented save at the base of cliffs everywhere rising up from the sea. Seals, also, if they could land here independent of this polar-bear scourge, which owns and controls St. Matthew, would find a climate that keeps snow and ice on the beaches until late in June, and still later; hence, I am well satisfied that the fur-seals have never visited this desolate land, nor will they ever rest upon it.*

24. DIGEST OF THE DATA IN REGARD TO THE FUR-SEAL ROOKERIES OF THE SOUTH ATLANTIC AND PACIFIC, AND NUMBER OF SKINS TAKEN THEREFROM.

DIFFICULTY OF FINDING CREDIBLE RECORDS.—Before I introduce the reader to this subject, I desire to call his attention to the source from which nearly all the information which we have touching it is derived. It comes from the verbal and written statements of whalers and other sea-faring men. The great difficulty which faces me as I attempt to make up this digest from such authority, is the fact that I know the failing of sailors too well—am too conversant with their habits of loose and positively erroneous narration. For instance, as an illustration of this trouble: suppose A had taken a large cargo of fur-seal skins from the Crozette islands some time in 1820-25, and when on the homeward stretch had been met at sea by B, another whaler or sealer; A would invariably tell B, in answer to queries as to where he got his catch, that he secured the seals at any other island far away from the real source of supply, in order that he might turn B aside, and have a clear field, and a full ship at the Crozettes again, when he should discharge at home and return. The story, however, would probably get into circulation, and into print, perhaps; and to-day is misleading us, just as it did B long ago.

SCANTY RECORDS.—If anybody doubts the correctness of my statement, made in the prefatory words of this monograph, to wit, that, though a sealing fleet of hundreds of vessels and thousands of men had repaired to the rookeries of the southern oceans, and had annually returned laden with the skins of the *Arctocephalus*, still not a definite line as to the true result, *i. e.*, the number of skins taken from those great Antarctic breeding-grounds, can be found in any writing, let him turn to the laborious work of Allen, who, for eight or nine long years, has ransacked the writings and the musty records of a century back; and see in his history of the North American pinnipeds the pitiful sum of knowledge which he has gathered in regard to the subject.† Prior to the tedious research and publication just referred to, in looking toward the same end, I gathered substantially as much information in the *Encyclopædia Britannica*, and in Hamilton's *Amphibious Mammalia*.‡ But the amount of this information is so abortive and faulty that I hesitate to reprint it here; yet, perhaps, its republication, together with the equally brief and indefinite compilation of Allen, may draw out from some unexpected quarter further knowledge. Hence, I submit the following:

DESTRUCTION OF THE FUR-SEALS FOR THEIR PELTRIES.

The value of the peltries of the fur-seal has led to wholesale destruction, amounting, at some localities, almost to extermination. The traffic in their skins appears to have begun toward the end of the last century. Captain Fanning, of the ship *Betsey*, of New York, obtained a full cargo of choice fur-seal skins at the island of Masafuera, on the coast of Chili, in 1793, which he took to the Canton market. Captain Fanning states that on leaving the island, after procuring his cargo, he estimated there were still left on the island between 500,000 and 700,000 fur-seals, and adds that subsequently little less than a million of fur-seal skins were taken at the island of Masafuera alone, § a small islet of not over twenty-five miles in circumference, and shipped to Canton.|| Captain Seammon states that the sealing-fleet off the coast of Chili, in 1801, amounted to thirty vessels, many of which were ships of the larger class, and nearly all carried the American flag. Notwithstanding this great slaughter, it appears that fur-seals continued to exist there as late as 1815, when Captain Fanning again obtained them at this island.¶

* This survey made by Lieutenant Maynard and myself is the first careful exploration of the island; the only work hitherto done was the approximate charting of its coast from the decks of Cook's and Billings' and Bering's vessels. Maynard and myself made a detailed plotting of the island, and gave a copy to the United States Coast Survey in August, 1874.

† Allen: *History North American Pinnipeds*, 1880, pp. 229, 230.

‡ Edinburgh, 1839.

§ Fanning: *Voyages to the South Sea*, etc., pp. 117, 118. Allen: *North American Pinnipeds*.

|| *Id.*, p. 364.

¶ *Id.*, p. 299.

In the year 1806 the fur-seal business appears to have been at its height at the Georgian islands, where, in the single season, 112,000 fur-seals are reported to have been taken, of which 57,000 were secured by a single American vessel (the *Aspasia*, under Captain Fanning). Vancouver, at about this date, reported the existence of large numbers of fur-seals on the southwest coast of New Holland. Attention was at once turned to this new field, and in 1804 the brig *Union*, of New York, Capt. Isaac Pendleton, visited this part of the Australian coast, but not finding these animals there in satisfactory numbers, repaired to Border's island, where he secured only part of a cargo (14,000 skins), owing to the lateness of the season. Later 60,000 were obtained at Antipodes island. About 1806 the American ship *Catharine*, of New York (Capt. H. Fanning), visited the Crozette islands, where they landed, and found vast numbers of fur-seals, but obtained their cargo from Prince Edward island, situated a few hundred miles southeast of the cape of Good Hope, where other vessels the same year obtained full cargoes.

In 1830 the supply of fur-seals in the southern seas had so greatly decreased, that the vessels engaged in this enterprise "generally made losing voyages, from the fact that those places which were the resort of seals", says Capt. Benjamin Pendleton, "had been abandoned by them, or cut off from them", so that the discovery of new sealing-grounds was needed. Undiscovered resorts were believed to exist, from the fact that large numbers of fur-seals were seen while cruising far out at sea, which must repair once a year to some favorite breeding-station.*

Captain Weddell states, that during the years 1820 and 1821 over 300,000 fur-seals were taken at the South Shetland islands alone, and that at the end of the second year the species had there become almost exterminated. In addition to the number killed for their furs, he estimates that not less than 100,000 newly-born young died in consequence of the destruction of their mothers.

So indiscriminate was the slaughter, that whenever a seal reached the beach, of whatever denomination, it was immediately killed. Mr. Scott states, on the authority of Mr. Morris, an experienced sealer, that a like indiscriminate killing was carried on at Antipodes island, off the coast of New South Wales, from which island alone not less than 400,000 skins were obtained during the years 1814 and 1815. A single ship is said to have taken home 100,000 in bulk, which, through lack of care in curing, spoiled on the way, and on the arrival of the ship in London the skins were dug out of the hold and sold as manure! At about the same time there was a similar wasteful and indiscriminate slaughter of fur-seals at the Aleutian islands, where for some years they were killed at the rate of 200,000 a year, glutting the market to such an extent that the skins did not bring enough to defray the expenses of transportation. Later, the destruction of fur-seals at these islands was placed under rigid restrictions (see *infra* the general history of the northern fur-seal), in consequence of which undue decrease has been wisely prevented. But nowhere else has there been a systematic protection of the fur-seals, or any measures taken to prevent wasteful or undue destruction.

THE SUBJECT IN 1873.—The above embodies Allen's gleanings of all that he could learn touching the subject. In 1873 I published the following :

The government of Buenos Ayres has, from the first, protected and cared for a small rookery of fur-seals under the bluffs at Cabo Corrientes, on its coast, where some 5,000 to 8,000 are annually taken, but the seals here have no hauling-grounds like those on St. Paul; they are taken with much labor under the high cliffs of this portion of the coast. This is the only government aid and care that the seals have ever received outside of Bering sea. The following extract shows the way in which the fur-seals of the South came into notice :

"Soon after Captain Cook's voyage in the *Resolution*, performed in 1771, he presented an official report concerning New Georgia, in which he gave an account of the great number of elephant-seals and fur-seals which he had found on the shores of that island. This induced several enterprising merchants to fit out vessels to take them; the former for their oil, the latter for their skins. Captain Weddell states that he had been credibly informed, that during a period of about fifty years, not less than 20,000 tons of oil were procured annually from this spot alone for the London market, which, at a moderate price, would yield about £1,000,000 a year.

"Seal-skins are very much used in their raw state as articles of apparel by the natives of the polar zones; when tanned, they are used extensively in making shoes; and the Eskimo have a process by which they make them water-proof (?), so that, according to Scoresby, the jackets and trousers made of them by these people are in great request among the whale-fishers for preserving them from oil and wet. But the skins are not only used in this raw and tanned state as leather; on account of their silky and downy covering they constitute still more important articles connected with the fur-trade. Thus considered, seal-skins are of two kinds, which may be distinguished as *hair-skins* and *fur-skins*. The former are used as clothing and ornament by the Russians, Chinese, and other nations, and the latter yield a fur which we believe exceeds in value all others which have been brought into the market. Many seals supply nothing but hair, while others in different proportions produce both the hair and, underneath it, soft and downy fur. The majority, we believe, are to be considered merely as hair-skins, similar to the bear or sable, and of these some are excellent of their kind, and much prized."—(Hamilton: *Amphibious Mammalia*, Edinburgh, 1839.)

It may be considered superfluous to read a lecture to the trader upon a matter so nearly touching his own interest, and yet there is one point, at the same time, which forms so essential a part of my subject, that I cannot withhold a word or two. These valuable creatures (fur-seals) have often been found frequenting some sterile islands in innumerable multitudes. By way of illustration, I shall refer only to the fur-seal as occurring in South Shetland. On this barren spot their numbers were such that it has been estimated that it could have continued permanently to furnish a return of 100,000 furs a year; which, to say nothing of the public benefit, would have yielded annually a very handsome sum to the adventurers. But what do these men do? In two short years, 1821 and 1822, so great is the rush that they destroy 320,000. They killed all, and spared none. The moment an animal landed, though big with young, it was destroyed. Those on shore were likewise immediately dispatched, though the cubs were but a day old. These, of course, all died, their number, at the lowest calculation, exceeding 100,000. No wonder, then, at the end of the second year, the animals in this locality were nearly extinct. So is it in other localities, and so with other seals, and so with the oil-seals, and so with the whale itself, every addition only making bad worse. All this might easily be prevented by a little less barbarous and revolting cruelty, and by a little more enlightened selfishness.

With regard to this seal-fishery of the south, the English and Americans have exclusively divided it between them, and with very great profits. It has lately been stated (1839) that they together employ not fewer than sixty vessels in the trade, of from 250 to 300 tons burden. These vessels are strongly built, and have each six boats, like those of the whalers, together with a small vessel of 40 tons, which is put in requisition when they reach the scene of their operations. The crew consists of about 24 hands, their object being to select a fixed locality from which to make their various *bateaux*. Thus it is very common for the ship to be moored in some secure bay and be partially unrigged, while at the same time the furnaces, try-pots, etc., required for making the oil are placed on shore. The little cutter is then rigged and manned with about half the crew, who sail about the neighboring islands and send a few men here and there on shore, where they may see seals or wish to watch for them. The campaign frequently lasts for three years, and in the midst of unheard-of privations and dangers. Some of the crew are sometimes left on distant, barren spots, the others being driven off by storms. They are left to perish or drag out for years a most precarious and wretched existence.†

* Fanning: *Voyages*, p. 487.

† Robert Hamilton: *Amphibious Mammalia*, Edinburgh, 1839.

With regard to the manner in which fur-sealing was carried on then, we find in the *Encyclopædia Britannica* the following facts:

From about the year 1806 till 1823 an extensive trade was carried on in the South seas in procuring seal-skins. These were obtained in vast abundance by the first traders, and yielded a very large profit. The time was when cargoes of those skins yielded \$5 or \$6 a piece in China, and the present price in the English market averages from 30 to 50 shillings per skin. The number of skins brought off from Georgia cannot be estimated at fewer than 1,200,000; the island of Desolation has been equally productive, and, in addition to the vast sums of money which these creatures have yielded, it is calculated that several thousand tons of shipping have annually been employed in the traffic.*

EXTERMINATION, THE RESULT.—This gives a very fair idea of the manner in which the business was conducted in the South Pacific. How long would our sealing interests in Bering sea withstand the attacks of such a fleet of sixty vessels, carrying from twenty to thirty men each? Not over two seasons. The fact that these great southern rookeries withstood and paid for attacks of this extensive character during a period of more than twenty years, speaks eloquently of the millions upon millions that must have existed in the waters now almost deserted by them.

EARLY AUTHORITIES ON THE APPEARANCE OF THE FUR-SEAL.—Whenever I have followed the records made by navigators of any one of these several islands in the Antarctic, from whence hundreds of thousands of fur-seals are said to have been annually taken, I have never found anything in the line of circumstantial evidence of the fact. For instance, had any vast rookery, such as is the one at Northeast point, St. Paul island, been in existence at Masafuera or Juan Fernandez, when they were visited by William Dampier in 1683—by Wood-Rogers in 1709—in 1740 and 1767 by Anson and Carteret, surely the extraordinary spectacle must have provoked their attention and description. So far from hinting at any such congregation of massed seal-life on the land, they, on the contrary, have more to say in regard to the wild goats which they found there, with the single exception of Dampier. Those were the progeny of the original stock left on the islands by Spanish pirates, long before (1563-'66). I select these two islands for especial reference in this connection, because they had been well known to seamen before the hunting of the fur-seal was a recognized business, and described by them. According to the accounts of the sealers, they were the source of several of the largest cargoes of fur-seal skins that were ever taken from any one or two places south of the equator.

ANSON'S VOYAGE, 1740-'41.—The best description of Juan Fernandez written prior to the ravages of the seal-hunting fleet (1800-'13), is the personal account made of it by Richard Walter, the chaplain to Lord Anson's flagship, the "Centurion", who lived ashore there for three months, June to September, 1741. Anson's fleet of seven "caravels" was dispersed by a fearful storm in rounding the Horn, and the crews well-nigh exterminated by scurvy. Only four of the vessels succeeded in joining him here, which was the preordained rendezvous; and the ninety days in camp at Juan Fernandez were passed in recuperation of the men and refitting the shattered ships.

REMARKABLE PHYSICAL CONTRAST BETWEEN ARCTIC AND ANTARCTIC ROOKERIES.—I offer this description, by Chaplain Walter, of these celebrated southern sealing-grounds, as an interesting statement for comparison with that which I have given of the Pribylov group. Certainly the ultra difference in natural character between St. Paul and St. George at the north, and Crusoe's isle and Masafuera on the south, is strongly defined and remarkable. The ground-trailing, or creeping willow (*Salix reticulata*) of Bering sea is the only tree or shrub that the fur-seal can rub against on the Pribylov islands; but his southern brother is acquainted with the shadow of the cabbage palm. The following is a copy of Walter's picture, drawn from life, and it is a very graphic one:

DESCRIPTION OF JUAN FERNANDEZ.—However, on the 10th of June, in the afternoon, we got under the lee of the island, and kept ranging along it at about two miles' distance, in order to look out for the proper anchorage, which was described to be in a bay on the north side. Being now nearer in with the shore, we could discover that the broken, craggy precipices, which had appeared so unpromising at a distance, were far from barren, being in most places covered with woods, and that between them there were everywhere interspersed the finest valleys, covered with a most beautiful verdure, and watered with numerous streams and cascades, no valley of any kind being unprovided with its proper rill. * * * At four in the morning our cutter was dispatched with our third lieutenant to find out the bay we were in search of, who returned again at noon with the boat laden with seals and grass, for although the island abounded with better vegetables, yet the boat's crew in their short stay had not met with them, and they well knew that even grass would prove a dainty, as, indeed, it was all soon eagerly devoured. [They were ill with scurvy.—H. W. E.] The seals, too, were considered as fresh provision, but as yet were not much admired, though they grew afterward into more repute, for what rendered them less valuable at this juncture was the prodigious quantity of excellent fish which the people aboard had taken during the absence of the boat.

The island of Juan Fernandez lies in the latitude of 33° 40' south, and it is a hundred and ten leagues distant from the continent of Chili. It is said to have received its name from a Spaniard who formerly procured a grant of it, and resided there some time with a view of settling on it, but afterward abandoned it. * * * The island is of an irregular figure. * * * Its greatest extent is between four and five leagues, and its greatest breadth somewhere short of two leagues; the only safe anchorage at this island is at the north side.

The northern part of this island is composed of high, craggy hills, many of them inaccessible, though generally covered with trees; the soil of this part is loose and shallow, so that very large trees on the hills soon perish for want of root, and are then easily overturned. * * * The southern, or rather the southwestern part of the island, as distinguished in the plan, is widely different from the rest, being dry, stony, and destitute of trees, and very flat and low compared with the hills on the northern part. This part of the island is never frequented by ships, being surrounded by a steep shore, and having little or no fresh water, and besides it is exposed to the southerly wind, which generally blows here the whole year round, and on the winter solstice very hard.

* Elliott: *Condition of Affairs in Alaska*, p. 261.

VEGETATION OF JUAN FERNANDEZ.—The trees, of which the woods on the northern side of the island are composed, are most of them aromatics, and of many different sorts. There are none of them of a size to yield any considerable timber, except the myrtle trees, which are the largest on the island, and supplied us with all the timber we made use of; but even these would not work to a greater length than forty feet. The top of the myrtle tree is circular and appears as if it had been clipped by art; it bears on its bark an excrescence like moss, which in taste and smell resembles garlic, and was used by our people instead of it. We found here, too, the the plemento (palmetto ?) tree, and likewise the cabbage tree, though in no great plenty; and, beside, a great number of plants of various kinds which we were not botanists enough either to describe or attend to.

To the vegetables I have already mentioned, of which we made perpetual use, I must add that we found many acres of ground covered with oats and clover; there were also some few cabbage trees upon the island, as was observed before; but as they generally grew upon the precipices and in dangerous situations, and as it was necessary to cut a large tree for every single cabbage, this was a dainty that we were rarely enabled to indulge in.

The excellence of the climate and the looseness of the soil render this place extremely proper for all kinds of vegetation; for if the ground be anywhere accidentally turned up it was immediately overgrown with turnips and Sicilian radishes.

This may in general suffice as to the soil and vegetable productions of this place, but the face of the country, at least the north part of the island, is so extremely singular that I cannot avoid giving it a particular consideration. I have already taken notice of the wild, inhospitable air with which it first appeared to us, and the gradual improvement of this uncouth landscape as we drew nearer, till we were at last captivated by the numerous beauties we discovered on the shore. And I must now add that the inland parts of the island did in no way fall short of the sanguine prepossessions which we first entertained in their favor. For the woods which covered most of the steepest hills were free from all bushes and underwood, and afforded an easy passage through every part of them; and the irregularities of the hills and precipices in the northern part of the island necessarily traced out by their various combinations a great number of romantic valleys, most of which had a stream of the clearest water running through them, that tumbled in cascades at the bottom of the valley by the course of the neighboring hills, was at any time broken into a sharp, sudden descent; some particular spots occurred in those valleys where the shaded fragrance of the contiguous woods, the loftiness of the overhanging trees, and the transparency and frequent falls of the neighboring streams, presented scenes of such elegance and dignity as would be with difficulty rivaled by any other part of the globe. It is in this place, perhaps, that the simple productions of unassisted nature may be said to excel all the fictitious descriptions of the most animated imagination.

ANIMALS OF JUAN FERNANDEZ.—It remains now only that we speak of the animals and the provisions which we met with at this place. Former writers have related that this island abounded with vast numbers of goats; and their accounts are not to be questioned, this place being the usual haunt of the buccaneers and privateers who formerly frequented these seas. And there are two instances, one of a Mosquito Indian and the other of Alexander Selkirk, a Scotchman, who were left here by their respective ships, and lived alone upon this island for some years, and consequently were no strangers to its produce. Selkirk, who was the last, after a stay of between four and five years, was taken off the place (in 1705) by the Duke and Dutchess privateers of Bristol, as may be seen at large in the journal of their voyage. His manner of life, during his solitude, was in most particulars very remarkable; but there is one circumstance which he relates, which was so strangely verified by our own observations, that I cannot help reciting it. He tells us, among other things, that he often caught more goats than he wanted; he sometimes marked their ears and let them go. This was about thirty-two years before our arrival on this island. Now, it happened that the first goat killed by our people at their landing had its ears slit, whence we concluded that he had doubtless been formerly under the power of Selkirk. This was indeed an animal of most venerable aspect, dignified with an exceeding majestic beard, and with many other symptoms of antiquity. During our stay on the islands we met with others marked in the same manner, all the males being distinguished by an exuberance of beard and every other characteristic of extreme age.

But the great number of goats, which former writers describe to have been found upon this island, are at present very much diminished; as the Spaniards, being informed of the advantages which the buccaneers and privateers drew from the provisions which goats' flesh here furnished them with, have endeavored to extirpate the breed, thereby to deprive their enemies of this relief. For this purpose they have put on shore great numbers of large dogs who have increased apace and have destroyed all the goats in the accessible part of the country; so that there now remain only a few amongst the crags and precipices, where the dogs cannot follow them. These are divided into separate herds of twenty or thirty each, which inhabit distinct fastnesses, and never mingle with each other. By this means we found it extremely difficult to kill them; and yet we were so desirous of their flesh, which we all agreed much resembled venison, that we got knowledge, I believe, of all their herds, and it was conceived, by comparing their number together, that they scarcely exceeded two hundred upon the whole island. * * * These dogs, who are masters of all the accessible parts of the island, are of various kinds, some of them very large, and are multiplied to a prodigious degree. They sometimes came down to our habitations at night, and stole our provisions, and once or twice they set upon single persons; but, assistance being at hand, they were driven off without doing any mischief. As at present it is rare for goats to fall in their way, we conceived that they lived principally upon young seals; and, instead, some of our people had the curiosity to kill dogs, sometimes, and dress them, and it seemed to be agreed upon that they had a fishy taste.

SEALS AT JUAN FERNANDEZ.—Goats' flesh, as I have mentioned, being scarce, we rarely being able to kill above one a day, and our people growing tired of fish (which as I shall hereafter observe abound at this place), they at last condescended to eat seals, which by degrees they came to relish and called it lamb. The seal, numbers of which haunt this island, hath been so often mentioned by former writers, that it is unnecessary to say anything particular about them in this place. But there is another amphibious creature to be met with here, called a sea-lion, that bears some resemblance to a seal, though it is much larger. This, too, we eat under the denomination of beef; and as it is so extraordinary an animal, I conceive it well merits a particular description. [This is the southern sea-elephant, *Macrorhinus leoninus*; not the sea-lion, *Otaria jubata*.—H.W.E.] They are in size, when arrived at their full growth, from twelve to twenty feet in length, and from eight to fifteen in circumference. They are extremely fat, so that after having cut through the skin, which is about an inch in thickness, there is at least a foot of fat, before you can come at either lean or bones; and we experienced more than once that the fat of some of the largest afforded us a butt of oil. They are likewise very full of blood; for if they are deeply wounded in a dozen places, there will instantly gush out as many fountains of blood; spouting to a considerable distance; and to try what quantity of blood they contained, we shot one first and then cut its throat, and measuring the blood that came from him, we found that beside what remained in the vessels, which, to be sure, was considerable, we got at least two hogsheds (!). Their skins are covered with a short hair, of a light dun color, but their tails and their fins, which serve them for feet on shore, are almost black; their fins, or feet, are divided at the ends like fingers, and the web which joins them not reaching to the extremities, and each of these fingers is furnished with a nail. They have a distant resemblance to an overgrown seal, though in some particulars there is a manifest difference between them, especially in the males; these have a large trunk, or snout, hanging down five or six inches below the end of the upper jaw, which the females have not, and this renders the countenance of the male and the female

easy to be distinguished from each other, beside the males are of a much larger size. The form and the appearance of both the male and the female are very exactly represented in the nineteenth plate, only the disproportion of their size is not usually so great as is there exhibited; for the male is drawn from life after the largest of these animals, which was found upon the island; he was the master of the flock, and from his driving of the other males and keeping a great number of females to himself, he was by the seamen ludicrously styled the bashaw. These animals divide their time equally between the land and sea, continuing at sea all the summer, and coming on shore at the setting in of the winter, where they reside during that whole season. In this interval they engender and bring forth their young, and have generally two at a birth, which they suckle with their milk, they being at first about the size of a full-grown seal. During the time these sea-lions continue on shore they feed upon the grass and verdure which grows near the banks of the fresh-water streams; and when not employed in feeding, sleep in herds in the most dry places they can find out. As they seem to be of a very lethargic disposition, and are not easily awakened, each herd was observed to place some of their males at a distance, in the nature of sentinels, who never failed to alarm them whenever any one attempted to molest, or even to approach them; and they were very capable of alarming, even at a considerable distance; for the noise they make is very loud and of different kinds, sometimes grunting like hogs, and at other times snorting like horses in full vigor. They often, especially the males, have furious battles with each other, principally about their females; and we were one day extremely surprised at the sight of two animals, which at first appeared different from any of all we had observed, but on a nearer approach they proved to be two sea-lions, who had been goring each other with their teeth, and were covered over with blood; and the bashaw, above mentioned, who generally lay surrounded with a seraglio of females, which no other male dared to approach, had not acquired that envied pre-eminence without many bloody contests, of which the marks still remained in the numerous scars which were visible in every part of his body. We killed many of them for food, especially for their hearts and tongues, which we esteemed good eating, and preferable even to those of bullocks. In general shape there was no difficulty in killing them, for they were incapable either of escaping or of resisting, as their motion is the most unskillful that can be conceived, their blubber, all the time they are moving, being agitated in huge waves under their skins. However, a sailor one day being carelessly employed in skinning a young sea-lion, the female from whence he had taken it came upon him unperceived, and getting his head in her mouth, she with her teeth scored his skull in notches in many places, and thereby wounded him so desperately that though all possible care was taken of him he died in a few days.

FEW BIRDS.—These are the principal animals which we found upon the island, for we saw but few birds, and those chiefly hawks, blackbirds, owls, and humming-birds. We saw not the pendella, which burrows in the ground, and which former writers have mentioned to be found here; but as we often met with their holes, we supposed that the dogs had destroyed them, as they have almost done the cats; for these were very numerous in Selkirk's time, but we saw not above one or two during our whole stay. However, the rats still keep their ground, and continue here in great numbers, and were very troublesome to us by infesting our tents nightly.

ABUNDANCE OF FISH.—But that which furnished us with the most delicious repasts at this island remains still to be described—this was the fish, with which the whole bay was most plentifully stored, and with the greatest variety, for we found here cod of a prodigious size, and by the report of some of our crew, who had been formerly employed in the Newfoundland fishery, not in less plenty than is to be met with on the banks of that island. We caught also cavallies, goppers, large breams, maids, silver fish, congers of a peculiar kind—above all, a black-fish, which we most esteemed, called by some, a chimney-sweeper, in shape resembling a carp. The beach, indeed, is everywhere so full of rocks and loose stones that there is no possibility of hauling the seine; but with hooks and lines we caught what numbers we pleased, so that a boat with two or three lines would return loaded with fish in about two or three hours' time. The only interruption we ever met with arose from the great quantities of dog-fish and large sharks which sometimes attended our boats and prevented our sport. Beside the fish we have already mentioned, we found here one delicacy in greater perfection, both as to size and flavor and quantity, than is, perhaps, to be met with in any other part of the world; this was sea cray-fish; they generally weighed eight or nine pounds apiece, were of a most excellent taste, and lay in such abundance near the water's edge that the boat-hooks often struck into them in putting the boat to and from the shore.

STRANGE CONTRAST IN SEALING-GROUNDS.—Thus ends Chaplain Walter's description of the plants, and the animals, and the fish of Juan Fernandez; and I quote him in full, because I wish to emphasize the decided difference in the temperament and constitution of the northern, or Alaskan, fur-seal from that of its southern relative, which seems to have repaired to Juan Fernandez and Masafuera in countless thousands, "millions," Dampier said, in 1683, to breed in a tropical climate, on an island infested by bands of wild dogs, and the waters surrounding alive with "large sharks"! Then, too, that the good prelate should have found fish so abundant where such multitudes of seals were aggregated, seems strange; and it also occurs rather odd to me that he should have rested content with Dampier's brief description of the fur-seal here, and passed the matter by, in the abrupt reference which he makes, declaring it superfluous to add more than "other writers" have spoken of.

THE ROOKERY OF MASAFUERA: A DESCRIPTION OF THE ISLET.—The island of Masafuera lies off the coast of Chili, in south latitude $33^{\circ} 45'$, west longitude $80^{\circ} 45'$, just west of Juan Fernandez, 93 miles; the surprising number of over 480,000 fur-seal skins are said to have been taken from it in a single season, some fifty years or so ago. Whether this immense aggregate was slain there or not, it is certain that no one rookery in all the South seas was of more importance. It is a high and mountainous volcanic islet, triangularly formed, and about 7 or 8 leagues in coast circuit. The general character of the island seems to be very much as I have indicated as characteristic of St. George, only that a luxuriant growth of exotic shrubbery is found thereon. On the north side of the island is a low point of land upon which the noted fur-seal rookery used to exist. "The seals," Carteret, in 1767, says, "were so numerous that I verily think if many thousands of them were killed in a night, they would not be missed in the morning; we were obliged to kill a noted number of them, as, when we walked the shore, they were continually running against us, making at the same time a most terrible noise. These animals yield excellent train-oil, and their hearts and plucks were very good eating, being in taste something like those of a hog, and their skins were covered with the finest fur I ever saw of the kind."

ANSON'S VISIT TO MASAFUERA.—Lord Anson sent one of his vessels over to Masafuera for the purpose of surveying it thoroughly, while he was lying at Juan Fernandez, refitting, June to September, 1740. Captain Saunders submitted substantially the following report, which Chaplain Walter indorses as valuable, inasmuch "as upon this

occasion the island of Masafuera was more particularly examined than, I dare say, it ever had been before, or, perhaps, ever will be again". He gives, in the succeeding language, the sum of the Anson survey:

The Spaniards have generally mentioned two islands under the name of Juan Fernandez, styling them the greater and the less; the greater being that island where we anchored, and the less being the island we are now describing, which, because it is more distant from the continent, they have distinguished by the name of Masa-Fuera. The Tryal sloop found that it bore from the greater Juan Fernandez W. by S., and was about twenty-two leagues distant. It is a much larger and better spot than has been generally reported; for former writers have represented it as a small barren rock, destitute of wood and water, and altogether inaccessible; whereas, our people found it was covered with trees, and that there were several fine falls of water pouring down its sides into the sea; they found, too, that there was a place where a ship might come to anchor on the north side of it; though, indeed, the anchorage is inconvenient, for the bank extends but a little way, is steep, too, and has very deep water upon it, so that you must come to an anchor very near the shore, and there lie exposed to all the winds but a southerly one; and, beside the inconvenience of the anchorage, there is, also, a reef of rocks running off from the eastern point of the island, about two miles in length, though there is little danger to be feared from them, because they are always to be seen by the seas breaking over them. This place has, at present, one advantage beyond the island of Juan Fernandez; for it abounds with goats, who, not being accustomed to be disturbed, were nowise shy or apprehensive till they had been frequently fired at. These animals reside here in great tranquillity, the Spaniards not having thought the island considerable enough to be frequented by their enemies, and have not, therefore, been solicitous to destroy the provisions upon it; so that no dogs have been hitherto set on shore there. Beside the goats, our people found there vast numbers of seals and sea-lions. And upon the whole they seemed to imagine that, though it was not the most eligible place for a ship to refresh at, yet, in case of necessity, it might afford some sort of shelter, and prove of considerable use, especially to a single ship, etc.

NEGLECT OF CHILI.—Chili has suffered these famous breeding-grounds of *Arctocephalus* to be ravaged and utterly eliminated; here she had perpetual interests worth many hundreds of thousands of dollars to her annually in the way of revenue, had they only been looked after and shielded from that wanton and mercenary destruction which has been visited upon them by sealers of all nations between 1806–1840. In 1717 the Spanish government revived and re-established the colony of Juan Fernandez on that island; but it was in the lapse of a few decades almost entirely ruined by an earthquake. During 1810 the Chilians gained their independence, and these two islands formed part of their possessions; in 1819 they established a sort of a Botany Bay on Juan Fernandez, and have had as many as 500 prisoners there at a time; it was found, however, to be too expensive, and when a mutiny, in 1835, placed the island in the hands of the convicts for a brief period, then the prisoners were all removed shortly afterward, and the island deserted, and remained so for forty-five or fifty years. At the present time the two islands, Fernandez and Masafuera, are leased by a Chilean merchant, who employs all the settlers in cutting wood, tending cattle, and, during the season, in sealing; the average catch is about 2,000 fur-seals annually.

VALUE OF THE ANSONIAN ACCOUNT JUST QUOTED.—The Ansonian description, thus quoted in much detail, is one that cannot fail to cause decided comment upon the marked physical differences under which the fur-seal thrives in the north on the islets of Bering sea, as *Callorhinus ursinus*, or in the south, as *Arctocephalus australis*, on Masafuera and Juan Fernandez. According to Walter, the size of these two subtropical islands is nearly in accord with the area which I found belonging to the Pribylov group; St. Paul being about the same superficial area of Juan Fernandez, with outlying rocks and islets alike peculiar to each; while St. George is a trifle larger, only, than the smaller Masafuera, with water bold and abrupt all around about them.

THE SUBTROPICAL ROOKERIES MERE ROCKY BREEDING KELPS.—The rookery sites of the fur-seal are not located by any writer on either island. I should judge from Walter's account that the entire desolate south shore of Juan Fernandez was a belt of cliff-bound breeding-grounds, where these animals laid as they do to-day under the bluffs on the Great Eastern rookery at St. George; and to which spot none of the Dampier or Anson voyagers resorted. Indeed, from all that I can learn of the physical structure of the islands to which the southern fur-seal repaired, the whole area presented suitable for these creatures to breed upon was of this character, save that of the Falkland islands; no such ground in general topography as St. Paul being known to the Antarctic, nor is it found elsewhere in the Arctic; but St. George is the common type of the southern seal-islands, as it is also typical of the entire Aleutian chain and Alaska generally.

STRANGE OMISSION OF CHAPLAIN WALTER.—The one queer thought in my mind relative to this lengthy visit of Anson to Juan Fernandez, is that the historian, from whom I have quoted so liberally, should not speak of the fur-seal; for, thirty-two years prior to his landing Captain Wood-Rogers, of the "Duke", a privateer, touched here to recruit, and found "Robinson Crusoe" Selkirk in lonely possession; that sailor left with Rogers, February 12, 1709, and he gave quite a story of his discovery of the seals, which is related by the captain. Curiously enough, according to Selkirk, the time when the fur-seal hauls out to breed on Juan Fernandez is that season of the year when Anson was there. Wood-Rogers reports him as saying, "Toward the end of the month of June these animals come on shore to bring forth their young and remain to the end of September, without stirring from the spot and without taking any kind of nourishment." (Kerr: *Collection of Voyages*: vol. xi.)

NUMBERS OF DEADLY ENEMIES THERE: SHARKS.—The time of breeding, therefore, is about the same as in Bering sea. Also, in this connection, Commodore Byron, who came, in his voyage round the world, to Masafuera in 1765, seeking wood and water, says:

Sunday, April 28, 1765; * * * there was, however, another species of danger here to which our cork (surf) jackets afforded us no defense, for the sea abounded with sharks of an enormous size, which, when they saw a man in the water, would dart into the very surf

to seize him. Our people, however, happily escaped them, though they were many times very near; one of them, which was upward of 20 feet long, came close to one of the boats that was watering, and having seized a large seal instantly devoured it at a mouthful, and I, myself, saw another of about the same size do the same thing under the ship's stern. (Hawkesworth: *Voyages*: London, 1773; vol. i, pp. 87-88.)

No other mention of seals is made by him here at Masafuera.

THE VOYAGE OF DAMPIER.—Fifty-seven years prior to Chaplain Walter's inspection and description of Juan Fernandez, Capt. William Dampier stopped here, also, to wood and to water, and to rally his crew from scurvy; he was making a "New Voyage Round the World", sailing from England; he passed two weeks there in these exercises of recuperation and refitting. The justly celebrated buccaneer delivers himself in this terse strain:

These [seals] at *John Fernandes* have fine thick short Fur; the like I have not taken notice of any where but in these Seas. Here are always thousands, I might possibly say millions of them, either sitting on the Bays, or going and coming in the sea round the Island, which is full of them (as they lie at the top of the Water playing and sunning themselves) for a mile or two from the shore. When they come out from the Sea they bleat like Sheep for their young; and though they pass through hundreds of other's young ones before they come to their own, yet they will not suffer any of them to snek. The young ones are like Puppies and lie much ashore, but when beaten by any of us, they as well as the old ones will make toward the Sea, and swim very swift and nimble; though on shore they lie very sluggishly, and will not go out of our way unless we beat them, but snap at us. A blow on the Nose soon kills them. Large Ships might here load themselves with Seal Skins and Trane oil; for they are extraordinary fat. (Dampier: *A New Voyage Round the World*, 1683; 7th edition, revised, 1703; vol. i, pp. 88, 90.)

DAMPIER, NOT COOK, FIRST TO NOTE THE FUR SEAL.—This account of Dampier will be instantly recognized, as far as he speaks of their habits, as an exact portrait of a breeding-rookery of the fur-seal. It is painfully brief, however; but it antedates Steller's contribution to the life and habits of the *Callorhinus* some 60 years; and is a hundred years nearly in advance of Captain Cook's mention of the same subject on the South Georgian (1771) and the Falkland islands (1774). He, therefore, and not Cook, deserves the credit of being the first man to call the attention of the civilized world to the value and the numbers of the fur-seal as it existed in southern waters, while Steller enjoys the same reputation with respect to those of the north.*

But, after searching through scores of antique traveler's volumes, and reading the musty records through and through—after extended personal intercourse with several of the very men who were active in fur-sealing throughout the Antarctic forty years ago, I have nothing but a mass of disjointed and conflicting data to show as to the real number of fur-seals slain in the waters south of the equator; while the record made by these men of the life and habit of *Arctocephalus australis* is that odd medley of fact and fiction, which destroys the value of the one and the romance of the other.

THE FALKLAND ISLANDS: THEIR DISCOVERY.—Captain John Davies, an Englishman, and a companion of Sir Thomas Cavendish, who made a privateersman's voyage to the South seas in 1592, was the first person who saw the Falkland islands. In 1594, Sir Richard Hawkins landed upon them and called them in honor of his queen and himself, "Hawkins' Maiden-land"; he said nothing about seals. In 1598 they were seen by a Dutch squadron, Verhagen, and Sebald de Wert commanding; they touched, and, ignorant of prior discovery, named them "Sebald's islands". Captain William Dampier, an Englishman, nearly 100 years after, in 1686, visited them and styled them "Sibbet de Wards"; he does not speak of seals there. They were finally called the Falkland islands by Strong, an English navigator in 1689; the manuscript journal of Strong yet remains unpublished and filed away in the archives of the British Museum. Captain Cook's emphatic mention of the fur-seal at South Georgia in 1771 gradually drew the attention of fur-sealers to a focus, when, from 1801 to 1840, inclusive, the whole Antarctic sealing-ground was ravaged by them, and the Falkland islands were the head center of all their operations. Great Britain took immediate jurisdiction, for the first time, over the Falkland islands in 1833.

EXTRAORDINARY ABSENCE OF SEALING DATA.—Such, in brief, are the circumstances that attended the early discovery of these celebrated Falkland islands, which were the rendezvous of a large sealing-fleet for a period of nearly 30 years—1800 to 1826, inclusive; yet, in spite of it, I can find little or no evidence of the extent of the catch thereon, or of the general location of the vast rookeries known to be slaughtered here during that extended

* William Dampier was the boldest and clearest-headed navigator, of all who then sailed into unknown seas. He discovered Australia a century before Cook saw it, cruising at that time as a buccaneer; his narrative gave Defoe the idea and supplied the incidents of "Robinson Crusoe", on Juan Fernandez; and there is no question in my mind that he possessed those qualities which distinguished Captain Cook, to the fullest extent; he only lacked the power of the government behind him, to have made a much earlier record, and entirely as meritorious as is the one which Cook left for posterity.

Although Dampier gives the first sensible and positive description of the fur-seal that I can find, yet there is one reference to this animal much earlier; but it requires the reading of an expert to notice that it arose from the sight of a fur-seal. It is found in the account of "Henry Braier, or Brewer, who, in behalf of the Dutch West India Company, landed on the coast of Staten Land, 9th March, 1642, en route to Chili. Here, at Valentine's bay, he "saw among the rocks several sea-lions and sea-dogs, about the bigness of a good European calf; some of a grayish, some of a brownish color, making a noise not unlike our sheep, and at the approach of our men they betook themselves to the sea." [Churchill: *Voyages*: London, 1700: vol. i, p. 456.] As the fur-seal is the only one of its family that makes a "noise not unlike our sheep", there is no question that Henry Brewer saw a number of female *Arctocephalus australis*, in especial; though males were along, they being so much larger, he deemed different, and termed them sea-lions.

Juan Fernandez, the Spanish navigator and adventurer, who, in 1593-'67, discovered, pre-empted, and colonized the island of his name, died there in 1575, or thereabouts; with his decease, the settlement was abandoned. He, probably, was the first of all civilized men to really know what a fur-seal was; but he has left no record, to my knowledge, of the fact.

interval. If these islands had been far beyond the track of commerce, as are all the other Antarctic sealing-grounds, save Juan Fernandez, then the remarkable, surprising want of data in this respect would not be so marked a feature to the history of the subject. The Falkland islands have not only been a common port of entry and departure for vessels of all nations since their discovery, in 1594, but as far back as 1770 they were a bone of contention and long-sustained diplomatic overtures between Spain and Great Britain, which came very near to plunging both countries into war on their sole account. I will recite the history of this disturbance, because its solution was the direct result of our losing possession of Vancouver's island and all that British Columbian territory to-day south of 54° 40' north latitude—a fur-sealing quarrel at the outset originated the whole difficulty.

TROUBLES HERE WHICH CAUSED US THE LOSS OF VANCOUVER'S ISLAND.—The piratical cruise of Sir Francis Drake in 1577, followed by that of Thomas Candish, or Cavendish, and John Davies, in 1592, whereby the Spanish settlements and galleons on the west coasts of the American continent were literally ravished, aroused the Castilians to a sense of their future danger, and they began rather slowly to provide means of shelter and future support. In prosecution of this plan for protecting the Spanish settlements and commerce of America, Francisco Bucareli, the governor of Buenos Ayres, on the 10th of June, 1770, forcibly expelled the handful of British "sealers" from their little establishment, Port Egmont, on the Falkland islands. As soon as the news of this expulsion reached London, the English secretary of state, lord Weymouth, addressed, September 12, a demand to the court at Madrid for the immediate disavowal, on its part, of the acts of Bucareli, and called for the prompt and unconditional restitution of the islands in the condition which they were before the writs of removal were executed. War was imminent, but Louis XV, of France, tendered his good offices as a mediator between the two disputants. The Spanish government acceded to this and placed the entire settlement of the controversy in the hands of the king of France, for his disposition as he should consider proper for the honor and rights of Spain. On the 22d of January, 1771, the offers of the king of France were accepted by the court of St. James. On this day the Spanish ambassador at London, Prince Masserano, presented to lord Rochford a declaration in the name of the king of Spain, saying that his Catholic majesty, solely desirous of maintaining peace with England, disavowed the acts of violence committed by the governor of Buenos Ayres, and engaged to restore to his Britannic majesty and his subjects "the port and fort at Egmont, in the Falkland islands, with all the artillery, stores, and effects, precisely" as they were before the 10th of June, 1770; at the same time, however, this offer of restitution contained the following significant clause: "this contract cannot, nor will it in any way, affect the question of prior right of sovereignty to the Falkland islands."

THE TREATY OF NOOTKA INFLUENCED HERE.—The expelled Falkland islanders were then replaced at port Egmont; but, in 1774, they were abruptly withdrawn by order of their own government, and these islands were again taken possession of by the Spaniards, who retained their hold until South America became independent. This abandonment of Great Britain provoked the bitterest political debates in Parliament, and feeling ran high all over that country; deeply imbued with this sentiment, Vancouver went out, in 1791, specially charged by the English government to take possession of the British territory on the northwest coast, according to the articles of the treaty of 1790 between Spain and England, and came to that region in the following year. The Spaniards claimed Vancouver's island then, in their own right, and in behalf of the Americans, captains Gray and Kendrick; their agent, Señor Juan Francisco de la Bodega y Quadra, was stationed at Nootka sound; and immediately after Vancouver's arrival, August 12, 1792, the negotiations were commenced, but Quadra could do nothing in behalf of their rights and those of American discovery. Vancouver peremptorily refused to entertain the subject. Quadra therefore surrendered "Quadra and Vancouver's island" to him, under protest, and withdrew every sign of Spanish authority from these waters of the North Pacific.

Thus the disturbances which arose over the abandonment of the Falkland islands in 1774, worked the loss of that northwest territory to us, through Spain, in 1792. My only regret (after an extended personal residence on Vancouver's island), concerning this whole subject, is that, out of all the uproar at the Falklands, nothing definite has been placed on record relative to the numbers and disposition of the fur-seal thereon.

25. CATALOGUE OF THE MAMMALS OF THE PRIBYLOV GROUP.

[Memoranda of collections made by Henry W. Elliott: Pribylov Islands: 1872 to 1876, inclusive.]

CANIDÆ:

Vulpes lagopus. BLUE OR ARCTIC FOX. Common.

Blue foxes were also, and are, natives of the Commander islands. Steller describes their fearlessness when the shipwrecked crew of the St. Peter landed there, 6th November, 1741. I saw them also at St. Matthew island.

In regard to these foxes the Pribylov natives declare that when the islands were first occupied by their ancestors, 1786-'87, the fur was invariably *blue*; that the present smoky blue, or ashy indigo color, is due to the coming of white foxes across on the ice from the mainland to the eastward. The white-furred *vulpes* is quite numerous on the islands to-day. I should judge that perhaps one-fifth of the whole number were of this color; they do not live apart from the blue ones, but evidently breed "in and in". I notice that Veniaminov, also,



THE CURIOUS SHAG.

NATIVES OVER THE CLIFFS.

OÖLOGICAL SKETCHES ON ST. GEORGE, BY THE AUTHOR.

makes substantially the same statement; only differing by charging this deterioration of the blue foxes' fur to the deportation from outside of red ones, on ice-floes; and adds that the natives always hunted down these "krassnie peeschee" as soon as their presence was known; hence my inability, perhaps, to see any sign of their posterity in 1872-'76.

The presence of these animals on the Pribylov islands is a real source of happiness to the natives, especially so to the younger ones. The little pup-foxes make pets and playfellows for the children, while hunting the adults during the winter gives wholesome employment to the mind and body of the native who does so. They are trapped in common dead-falls, steel spring-clips, or beaver traps, and shot. A very large portion of the gossip on the island is in relation to this business.

PINNIPEDIA:

Callorhinus ursinus. FUR-SEAL. Abundant.

Eumetopias Stelleri. SEA-LION. Common.

Phoca vitulina. HAIR-SEAL. A few only.

While the *Phocidae* are so scant as to number and variety in the waters of the North Pacific and Bering sea, yet they fairly rival the myriads of the fur-seal here by their presence in the waters of the North Atlantic; and, also, their surprising aggregate in the Caspian sea. So great is the volume of hair-seal life in the circumboreal region of the Orient, that the astonishing sum of from 850,000 to 900,000 *Phocidae* are annually taken there! and from the Caspian sea an additional count of a yearly average of 130,000, making a round million of these animals slaughtered every season. At least, such are the data which we find in the writings of the only credible authorities known, viz, Bonnycastle, *Newfoundland*, in 1842, vol. 1, p. 159; Carroll, *Seal and Herring Fisheries of Newfoundland*, 1873, p. 9; Lindeman, *Pet. Geogr. Mitth.*, pp. vi, 118; *Die Arktische Fischerei der Deutschen Seestädte*, 1620-1868; Brown, *Man. Nat. Hist. Geol., etc., of Greenland*, 1868-1875; Melsom, *Pet. Geogr. Mitth.*, 1869, p. 81; Petersen, *Pet. Geogr. Mitth.*, 1870, pp. 194 et seq., 1871, pp. 35 et seq.; Lovenskiöld, *Land and Water* (newspaper), 1875, p. 160; Schultz, *Rep. U. S. Com. Fish and Fisheries*, pt. iii, for 1873-'74 and 1874-'75 (a translation of the original published at St. Petersburg in 1875). Allen, in his *History N. A. Pinnipeds*, has so liberally compiled and quoted from these authors that it would be simply superfluous service to reprint those records here.

Odobæus obesus, var. *rectipennis*. WALRUS. A few only.

CETACEA:

Orca gladiator. KILLER-WHALES. A few only.

Megaptera versabilis. HUMPBACK WHALES. A few only.

RODENTIA:

Myodes obensis. LEMMING. Abundant on St. George only.

Mus musculus. HOUSE MOUSE. Common in the villages (imported by man).

26. CATALOGUE OF THE BIRDS OF THE PRIBYLOV GROUP.

VAST NUMBERS OF WATER-FOWL.—In the seasons of 1872-'73, respectively, throughout the ornithological breeding terms on St. Paul and St. George, I neglected no opportunities, as they occurred, to secure everything that was peculiar to the feathered life upon these islands. The dreary expanse and lonely solitudes of the North owe their chief enlivenment, and their principal attractiveness for man, to the presence of the vast flocks of circumboreal water-fowl, which repair thither annually. It is true that the mammalian life of the Pribylov group renders its immense aggregate of avifauna insignificant by comparison; but to the naturalist and many who are not technically versed, the following check-list of those species which I found there, together with a brief biography accompanying each title, may be of more than passing interest.

While a few species of water-fowl come to these islands in myriads for the purpose of breeding, it will be noticed that the list of names met with here is a brief one; still it is of much value to the naturalist, inasmuch as it comprises so many desiderata scarcely to be obtained elsewhere.

THE IMMENSE ROOKERIES OF ST. GEORGE.—Over fifteen miles of the bold, basaltic, bluff line of St. George island is fairly covered with nesting gulls, *Rissa*, and "arries", *Uria*, while down in the countless chinks and holes over the entire surface of the north side of this island millions of "choochkies", *Simorhynchus pusillus*, breed, filling the air and darkening the light of day with their cries and fluttering forms. On Walrus islet the nests of the great white gull of the north, *Larus glaucus*, can be visited and inspected, as well as those of the sea-parrot or puffin, *Fratercula*, sp., shags or cormorants, *Graculus* sp., and the red-legged kittiwake, *Larus breirostris*. These birds are accessible on every side, can be reached, and afford the observer an unequalled opportunity of taking due notice of them through their breeding-season, as it begins in May and continues until the end of September.

ECONOMIC VALUE TO INHABITANTS.—Not one of the water-birds found on and around the islands is exempted from a place in the native's larder; even the delectable "orelie" are unhesitatingly eaten by the people, and indeed

these birds furnish, during the winter season in especial, an almost certain source of supply for fresh meat. But the heart of the Aleut swells to its greatest gastronomic happiness when he can repair, in the months of June and July, to the basaltic cliffs of St. George, or the lava table-bed of Walrus islet, and put his grimy hands on the gaily colored eggs of the "arrie", *Lomvia arra*; and if he were not the most improvident of men, instead of taking only enough for the day, he would lay up a great store for the morrow, but he never does. On the occasion of one visit, and my first one there, July 5, 1872, six men loaded a badarraah at Walrus islet, capable of carrying four tons exclusive of our crew, down to the water's edge with eggs, in less than three working hours.

DISAPPEARANCE OF BIRDS IN WINTER.—During the winter months the birds are almost wholly absent, especially if the ice shall have closed in around about the islands; then there is nothing of the feathered kind save the stupid shag, *Graculus bicristatus*, as it clings to the leeward cliffs, or the great burgomaster gull, which sweeps in circling flight high overhead; but, early in May they begin to make their appearance; and they come up from the sea overnight, as it were, their chattering and their harsh caroling wakes the natives from their slothful sleeping, which, however, they gladly break, to seize their nets and live life anew, as far as eating is concerned. The stress of severe weather in the winter months, the driving of the snow "boorgas", and the floating ice-floes closing in to shut out the open water, are cause enough for the disappearance of the water-fowl during the hyemal season.*

CASTAWAY BIRDS ON THE PRIBYLOV ISLANDS.—The position of the islands is such as to be somewhat outside of the migratory path pursued by the birds on the mainland; and, owing to this reason, they are only visited by a few stragglers from that quarter, a few from the Asiatic side, and by the millions of their own home-bred and indigenous stock. One of these migratory species, *Streptilas interpres*, however, comes here every summer for three or four weeks' stay, in great numbers, and actually get so fat, in feeding upon the larvæ which abound in the decaying carcasses over the killing-grounds, that it usually bursts open when it falls, shot on the wing. A heavy easterly gale often brings a strange bird to the islands from the mainland; a grebe, *Podiceps griseigena*, was stranded on St. George in 1873, whereupon the natives declared the like of which they had never seen before; when I found a robin one cool morning in October, the 15th, the natives told me that it was an accident—brought over by some storm or gale of wind that took it up and off from its path across the tundra of Bristol bay. The next fair wind sweeping from the north or the west could be so improved by this robin, *Turdus migratorius*, that it would spread its wings and as abruptly return. Thus hawks, owls, and a number of foreign water-fowls visit the islands, but never remain there long.

FAILURE TO INTRODUCE RAVENS.—The Russians tried the experiment of bringing up from Sitka and Oonalashka a number of ravens as scavengers, a number of years ago, and when they were very uncleanly in the village, in contrast with the practice of the present hour; they reasoned that they would—these ill-omened birds—be invaluable as health officers; but the *Corvidæ* invariably, sooner or later, and within a very short time, took the first wind-train back to the mainland or the Aleutian islands; yet the natives say that if the birds had been young ones instead of old fellows, they would have remained. I saw a great many, however, at St. Matthew island, in August, 1874; also, their slowly-marked flight overhead was a common sight on St. Lawrence.

POULTRY KEPT BY NATIVES.—The natives keep a small number of chickens, and often they take their poultry into their living rooms and coop them up in the corners; they get return in eggs; but of all the forlorn, wretched, bedraggled specimens of domestic fowls, those that have to shiver and shake themselves outside when viewed on the seal-islands are the most miserable. They do not exactly freeze, but the raw, damp, incessant violence of the weather keeps them inactive and covering for such long, unbroken periods that their feathers seem to fall out, and disease marks them for its own.

OÖLOGICAL WEALTH OF WALRUS ISLAND.—I am much divided in my admiration of the two great bird-rookeries of the Pribylov group, the one on the face of the high bluffs at St. George, and the other on the table-top of Walrus islet; but, perhaps, the latter place gives, within the smallest area, the greatest variety of nesting and

* While daily served on St. George, during June and July, with eggs of indigenous sea-fowl, I recorded my gastronomic comparisons which occurred then as I ate them. Here follows a recapitulation:

Fresh-laid eggs of "lupus," or *F. glacialis*... Best eggs known to the islands; can be soft-boiled or fried, and are as good as our own hens' eggs; the yolk is light and clear; the size thereof is in shape and bulk like a duck's egg; it has a white shell. SEASON: June 1 to 15, inclusive; scarce on St. Paul and not abundant on St. George.

Fresh-laid eggs of "arrie," or *L. arra*..... Very good; can be soft-boiled or fried; are best scrambled; yolks are dark; no strange taste whatever to them; pyriform in shape; large as a goose egg; shell gaily colored; they are exceedingly abundant on Walrus island and St. George; tons of them. SEASON: June 25 to July 10, inclusive.

Fresh-laid eggs of gulls; *Larida*..... Perceptibly strong; cannot be relished unless in omelettes; yolks very dark; size and shape of our hen's egg; shell dark, clay-colored ground, mottled. SEASON: June 5 to July 20, inclusive; they are in moderate supply only.

The other eggs in the list, such as those of the "choochkie", the "shag", and the several varieties of water-fowl which breed here, are never secured in sufficient quantity to be of any consideration as articles of diet. It is, perhaps, better that the scarcity of their kind continue, judging from the strong smack of the choochkie's, the repulsive taint of the shag's, and the "twang" of the sea-parrot's, all of which I tasted as a matter of investigation.





GATHERING EGGS ON WALRUS ISLAND.



THE "KANOOSKA"



CLEOPATRA'S NEEDLE.
(ST. LAWRENCE ISLAND.)



NO ROOM FOR ARGUMENT.

ORNITHOLOGICAL SKETCHES ON THE SEAL-ISLANDS, BY THE AUTHOR.

Herewith presented through the courtesy of Harper Brothers.

breeding birds; for here the "arrie" and many gulls, cormorants, sea-parrots, and auks come to lay their eggs in countless numbers. The foot and brow of the low, cliff-like sea fronts to this island are occupied almost exclusively by the "arries", *Lomvia arra*, which lay a single egg, each, on the surface of the bare rock, and stand, just like so many champagne bottles, straddling over them while hatching; only leaving at irregular intervals to feed, and then not until their mates relieve them. Hundreds of thousands of these birds, alone, are thus engaged about the 29th of every June, on this little rocky island, standing stacked up together as tight as so many sardines in a box—as thickly as they can be stowed—each of them uttering an incessant, deep, low, hoarse, grunting noise. How fiercely they quarrel among themselves—everlastingly; and in this way thousands of eggs are rolled off into the sea, or into crevices, or into fissures, where they are lost and broken.

TOUGHNESS OF ARRIE EGG-SHELLS.—The "arrie" lays but one egg. If it is removed or broken she will soon lay another; but, if undisturbed after depositing the first, she undertakes its hatching at once. The size, shape, and coloration of this egg, among the thousands which came under my observation, are exceedingly variable. A large proportion of the eggs become so dirty, by rolling here and there in the guano while the birds tread and fight over them, as to be almost unrecognizable. I was struck by the happy adaptation of nature to their rough nesting; it is found in the toughness of the shell of the egg—so tough that the natives, when gathering them, throw them as farmers do apples into their tubs and baskets, on the cliffs, and then carry them down to the general heap of collection near the boats' landing, where they pour them out upon the rocks with a single flip of the hand, just as a sack of potatoes would be emptied; and then again, after this, they are quite as carelessly handled when loaded into the "bidarra", sustaining through it all a very trifling loss from crushed or broken ones.

BIRD ZONES ON WALRUS ISLET.—Those "arries" seem to occupy a ribbon in width, and draw around the outward edges of the flat table-top to Walrus island a regular belt, keeping all to themselves; while the small grassy interior from which they are thus excluded is the only place, I believe, in Bering sea where the great white gull, *Larus glaucus*, breeds. Here I found among the little mossy tussocks the burgomaster building a nest of dry grass, sea ferns, *Sertularia*, etc., very nicely laid up and rounded, and in which it laid usually three eggs, sometimes only a couple; occasionally I would look into a nest with four. These big birds could not breed on either of the other islands in this manner, for the glaucous gull is too large to settle on the narrow shelf ledges of the cliffs, as the smaller *Laride* and other water-fowls do; and those places which would receive it might also be a hunting-ground and footing to the foxes.

The red-legged kittiwake, *Larus breirostris*, and its cousin, *Larus tridactylus*, build in the most amicable manner together on the faces of the cliffs, for they are little gulls, and they associate with the cormorants, sea-parrots, and auks, all together; and, with the exception of the latter, the nests are very easy of access. All birds, especially the "arries", have an exceedingly happy time of it on this Walrus islet—nothing to disturb them, in my opinion—free from the ravenous maw of the foxes over at St. Paul, and from the piratical and death-dealing sweep of owls and hawks, which infest the Aleutian chain and the mainland.

SYSTEMATIC LIST OF THE AVIFAUNA.—I will now offer, in natural sequence, a list of the names which are to be seen every year upon the ornithological register of the Pribylov islands, and the transient ones, also:

1. *Turdus migratorius*. ROBIN; "RAP-O-LOOF."

Casual, and rarely seen; never resident. Specimen secured October, 1872.

2. *Anorthura troglodytes* var. *alascensis*. ALASKAN WINTER WREN; "LIMMER-SHIN."

This wee bird is not migratory, but remains permanently upon St. George; its nest is built in small, deep holes and crevices of the cliffs. I have not myself seen it, but the natives say that it lays from eight to ten eggs in a nest made of dry grass and feathers, roofed over, with an entrance at the side to the nest-chamber, being thus elaborately constructed.

The male is exceedingly gay during the period of mating and incubation, flying incessantly from plant to plant, or from rock to rock, and singing a rather loud song for a small bird. I shot the young, fully fledged, on the 28th of July; it differed only from the parent in having a much shorter bill, and a darker and more diffuse coloration. Although St. Paul island is but twenty-seven miles to the northwest, as the crow flies, from St. George, not a single specimen of this little wren has been seen there. I made, during the whole season of 1872, unavailing search for it.

The natives' name, "limmer-shin," signifies a chew of tobacco; and, as the bird is not as large as some quids which I have seen, the name is quite appropriate, for the dull brown and black plumage of the bird suggests it also.

3. *Leucosticte tephrocotis* var. *griseinucha*. GRAY-EARED FINCH; "PAHTOSHIKIE."

This agreeable little bird, always cheerful and self-possessed, is a regular and permanent settler on the islands, which it never leaves. In the depth of dismal winter, as well as in the halo of a summer's day, the pahotoshikie greets you with the same pleasant chirrup, wearing the same neat dress, as if determined to make the best of everything. It is particularly abundant on St. George, where its habit may be studied to great advantage. The pahotoshikie nests in a chink or crevice of the cliffs, building a warm, snug home for its little ones, of dried grasses and moss, very neatly put together, and then lined with a few superfluous feathers. The eggs vary in number from

three to six; there generally is four. They are pure white with a delicate rosy blush, when fresh, and measure 0.97 by 0.67 of an inch. The young break the shell at the expiration of twenty or twenty-two days' incubation, the labor of which is not shared by the male; he, however, brings food to his mate, singing as most birds do of his kind, highly elated by the prospects of paternity. The chicks, at first, are sparsely covered with a sprinkling of dark-gray down, and in two or three weeks gain their feathers, fitting them for flight, though they do not acquire the ash and black of the head, while the chocolate-brown on the back is rich, and the rosy tints of their feather-tips turn to crimson. These bright hues of adolescence do not appear until they are one year old; between the old birds, however, there is no outward dissimilarity in size or coloration, the male and female being exactly alike. They feed upon various seeds and insects, as well as the larvæ which swarm on the killing-grounds. They are fearless and confiding, fluttering in the most familiar manner around the village huts. In the summer of 1873 a pair built their nest and reared a brood under the eaves of the old Greek church, that tottered on its rotten foundations, at St. George. It has no song, but utters a low, mellow chirp, sounding this note both flying and sitting, in the same cadence. It seems to pair off altogether and never reassembles in flocks. I secured a large number of beautiful specimens of the adults of both sexes in neat breeding attire, and others illustrating the earliest plumage of the young.

4. *Plectrophanes nivalis*. SNOW BUNTING; "SNAGUISKIE."

The snow-bird is another permanent resident of these islands, but one which, unlike the *pahtoshkie*, you will notice, is very shy and retiring, nesting high on the rocky, broken uplands, never coming down to the village, except during unusually severe or protracted cold weather. This bird builds an elegant and elaborate nest of soft, dry moss and grass, and lines it warmly again with a thick bed of feathers. It is placed on the ground beneath some heavy lava-shelf or at the foot of an enormous boulder. Five eggs are usually laid, about the 1st of June; they are an inch long by two-thirds broad, of a grayish or greenish white, spotted sometimes all over, sometimes at or around the larger end only, with various shades of rich dark-brown, purplish-brown, and paler neutral tints. Sometimes the whole surface is quite closely clouded with diffuse reddish-brown markings. Upon the female the entire labor of the three weeks' incubation required for the hatching of her brood devolves. During this period the male is assiduous in bringing food; and at frequent intervals sings his simple but sweet song, rising, as he begins it, high up in the air, as the skylark does, and at the end of the strain drops suddenly to the ground again. The young are early provided with a gray, downy coating, which is speedily replaced by one resembling that of the adult female; and, in less than four weeks from the date of hatching, the little "snaguiskie" is as big as its parents and weighs more. The food of this species consists of the various seeds and insects peculiar to the rough, higher grounds it frequents, being especially fond of the small coleopterous beetles found on the island. It never flies about the rocks here, and cannot be called at any season of the year gregarious, like its immediate relative, the Lapland longspur, with which it is associated on these sea-girt islets.

5. *Plectrophanes lapponicus*. LAPLAND LONGSPUR; "KARESCH-NAVIE SNAGUISKIE."

This bird is the vocalist *par excellence* of the Pribylov group, singing all through the month of June in the most exquisite manner, rising high in the air and hovering on fluttering wings over its sitting mate. The song is so sweet that it is always too short, though it lasts a few moments, with brief intervals only. This songster is much more shy and reserved than the common snow-bunting; and it rarely enters the village. It is most abundant on St. Paul island, where, unlike the snowflake, it seeks the low, grassy grounds, both for food and resting, being never found among the rough boulders chosen for a home by the other *Plectrophanes*. The two nests, which I found, were built in tussocks of grass on the low, hummocky flat between the village and the main ridge of St. George, sheltered and half concealed beneath a drapery of withered grass. In each case the mother-bird did not fly away till I almost stepped upon her nest, when she quickly fluttered off and disappeared in perfect silence. Those nests and females in breeding dress were the first of their kind to arrive at the Smithsonian collection. One nest contained four and the other five eggs, rather smaller than the snow-bunting, and of a rich, gray-brown color, with deep shades of brown running over them in spots and suffused lines. These examples were not discovered until the 7th of July, at which date the eggs in both were perfectly fresh. They were, probably, not laid until about the end of June. The young appear in the same manner as those of *P. nivalis*. The males do not assume the distinctive coloration of their sex until the next season. The natives say that very severe weather sometimes drives the longspur away, although the other relative, the snow-bunting, is never forced to leave.

6. *Corvus corax*. RAVEN; "VAR-RONE."

As I have remarked in my general introduction, the experiment of introducing ravens was unsuccessfully tried by the Russians, but the natives still claim that if a number of young birds were brought here and raised, they could be induced to remain upon the islands during the whole season. They say that the failure to keep those birds brought up from Oonalashka, on several occasions prior, was due to the fact of their being old birds.

7. *Falco sacer*. GYRFALCON.

The specimen of this bird, in my collection, was evidently stranded and forced out of its usual flight when I secured it on the Reef point at St. Paul island, March, 1873. It was the only one that I saw while there.

8. *Charadrius fulvus*. GOLDEN PLOVER.

The appearance of this specimen in my collection, was another new item added to the list of North American birds, since it is the first American specimen of the true Asiatic *fulvus*, and not the North American var. *virginicus*. It came to St. Paul as a wanderer on the 2d of May, 1873, and the natives told me that it was a frequent visitor in that manner; a few stragglers landing in April, or the first days of May, and passing on their way north, never remaining long. They return in greater number, however, by the close of September, and grow fat upon the larvæ generated over the killing-grounds, leaving for the south by the end of October.

9. *Streptilas interpres*. TURNSTONE; "KRASS-NIE KO-LIT-SKIE," or "KRASSNIE NOGIE."

This is a very handsome bird when in full plumage, and arrives in flocks of thousands about the third week in July, taking its departure from the islands along by the 10th of September. It does not breed here, and it comes, undoubtedly, to feed upon the larvæ and maggots of the killing-grounds. It is certainly one of the most attractive of plovers, as it struts and marches with bright-red legs and intense black-banded breast, and a back shaded with brown and green reflections. I am at a loss to fix its breeding place; I have met with it at sea 700 miles from the nearest land, flying northwest toward the Aleutian islands, my ship being 800 miles west from the straits of Fuca.

10. *Lobipes hyperboreus*. NORTHERN PHALAROPE.

A few couples breed on the islands, nesting around the margins of the lakelets. The egg I was unable to find, but I secured several newly-hatched young ones, which were very interesting little creatures. They are only two or three inches long, with bill about a third of an inch in length, and no thicker than an ordinary dressing-pin. The down of the head, neck, and upper parts is a rich brownish yellow, variegated with black, the crown being of this color mixed with yellow, and a long stripe extends down the back, flanked with one over each hip, and another across the rump, and a shoulder spot on each side. The under parts are a grayish, silvery white. The old bird, when startled or solicitous for the safety of its young, utters a sonorous "tweet" call, quickly repeated, with long intervals of silence between them.

11. *Phalaropus fulicarius*. RED PHALAROPE.

Though I found this bird very much more abundant than the preceding species at certain times, yet I am satisfied that it does not breed here. It is found, like the other, by the marshy margins of the pools and ponds, usually solitary, though paired occasionally, but never in flocks. The earliest arrivals occur in June, but the birds reappear in greatest number about the 15th of August. They all leave by the 5th of October.

12. *Tringa ptilocnemis*. THICK-BILLED SAND-PIPER. "KO-LITS-KIE."

The most interesting result, in some respects, of my ornithological work, is the determination by my specimens of the occurrence of this species in abundance on the Pribylov islands, where it breeds. That discovery adds a species, previously unrecognized as North American, to our fauna. As a long, elaborate, and graphic description of the bird, based upon my collections, was made by Dr. Elliott Coues,* when he reviewed my labor on these islands, I shall not duplicate it here; but I wish to give him credit for his prompt recognition of the novelty; and in this connection let me add, that in 1874 I saw it just as abundantly on St. Matthew island. I should say, it is the only wader that incubates on the Pribylov islands, with the marked exception of a stray couple now and then of *Phalaropus hyperboreus*. It makes its appearance early in May, and repairs to the dry uplands and mossy hummocks, where it breeds. The nest is formed by the selection of a particular cryptogamic bunch, and there setting. It lays four darkly-blotched pyriform eggs, and hatches them within twenty days. The young come from the shell in a thick, yellowish down, with dark brown markings on the head and back, getting the plumage of their parents and taking to wing as early as the 10th of August; at this season old and young flock together for the first time, and confine themselves to the sand-beaches and surf-margins about the islands for a few weeks, when they take flight by the 1st or 5th of September, and disappear until the opening of the new season. It is a most devoted and fearless parent, and will flutter in feigned distress around by the hour, uttering a low, piping note, should one approach near to its nest. It makes a sound ridiculously like the cry of our tree-frogs, and I searched in consequence unavailingly for several weeks, deceived by the call of this bird, for the presence of such a reptile.†

* *Condition of Affairs in Alaska*: H. W. Elliott: 1874, p. 182.

† When I was collecting this bird, I took it to be a well-defined *Tringa maritima*; and did not suppose for an instant, that it was an undescribed species to the avifauna of both the old world and the new. Had I thought seriously of it, however, I might have had my suspicions aroused then, and hence given it still more attention, so that my large series of specimens might have embraced the autumn or perfected fall plumage; and, I would also have secured many nests, rather than the single one which I did get. My old friend, Dr. Elliott Coues, was the first to discover the originality of this new sand-piper, though he was very closely followed by that excellent authority on Limicoline birds, J. E. Harting, F. L. S., etc., of London, to whom Professor Baird sent one of my specimens of 1872, also, thinking it to be *T. maritima*. A curious fact, however, is the remarkably restricted range which this strongly-built bird enjoys in Alaska; it has been seen nowhere except on these Pribylov islands and on St. Matthew, 200 miles to the north of them; where, in 1874, I saw large numbers, breeding as they do here. I did not see one on St. Lawrence, again to the northward, 180 miles from St. Matthew island, and it has never been detected on the mainland, or the islands of the Aleutian chain, the peninsula, or northwest coast, inclusive, although that country has been scoured over thoroughly by naturalists and collectors during the last fifteen years; therefore unless it is found and winters on the large islands of the Commander group, 700 miles to the westward of the Pribylovs, I believe that its restriction as above defined is only paralleled by the square mile limit of distribution peculiar to several species of South American humming birds.

13. *Limosa uropygialis*. WHITE-RUMPED GODWIT.

This wader is a mere chance visitor, never breeding here. It comes in a straggling manner, early in May, and passes northward over the islands, hardly stopping on the way. It reappears, toward the end of August, going south, in flocks of a dozen to fifty, making then, as before, scarcely an appreciable visit.

14. *Heteroscelus incanus*. WANDERING TATTLER.

This bird is also migratory, and does not breed here. It comes every year early in June, and subsequently reappears toward the end of July, when I again observed it. It may be obtained on the rocky beaches, where it flits at the surf-wash, shy and quiet.

15. *Numenius borealis*. ESKIMO CURLEW.

I never saw but the single specimen, which I shot and preserved, on the seal-islands while up there; but the natives assured me that some years, and quite often, it appears in large flocks during the fall. This one was procured by me in June, 1872, on St. Paul island.

16. *Philacte canagica*. EMPEROR GOOSE.

This goose of the great Yukon river gets over here by mistake, I fancy, for the flock of which I witnessed the capture, landed on St. Paul island so exhausted, that the natives ran the birds down in open chase over the grass. I found the flesh of *Philacte*, contrary to report, free from any unpleasant flavor, and in fact very good. The objectionable quality is only skin deep, and may be got rid of by the least care, when the cook prepares it for the table.

17. *Branta canadensis*. WHITE-COLLARED GOOSE; "CHORNIE GOOSE."

This species, like the former, seems to be a mere straggler and irregular visitor, evidently driven by high winds to rest here for a brief period, ere they resume their customary lines of migration along the mainland.

18. *Anas boschas*. MALLARD DUCK.

A pair of these fine birds bred on the island of St. Paul during the season of 1872, at Polavina lake, and several were observed later in the fall. The mallard I also noticed on St. George island, but the natives say it is not a regular visitor.

19. *Mareca penelope*. WIDGEON.

It is an interesting fact, that this widgeon, as my specimens attest, which visits the Pribylov islands, is not *M. americana*, as might be anticipated, but it is the true *M. penelope*. I saw only a few specimens, and saw them rarely. They were solitary examples, never in pairs, and it does not breed on the islands; apparently the few individuals, which I noted during two years of observation, were wind-bound or estray.

20. *Harelda glacialis*. LONG-TAILED DUCK; "SAAFKA."

This noisy, chattering example is common and resident. It appears everywhere on the pools, ponds, sloughs, and lakes of the two islands; in limited numbers, however. The *Saafka* is a very lively bird, particularly in the spring, when with the breaking up of the ice it flies into the open reaches of water, and raises its peculiar, sonorous, and reiterated cry of *ah-naah-naah-yah*, which rings cheerfully upon the ear after the silence and desolate dearth of an ice-bound winter.

21. *Histrionicus torquatus*. HARLEQUIN DUCK.

My experience with this bird is radically different from another writer, he stating that it is an essentially solitary species, found alone or in pairs, only in the most retired spots, on the small rivers flowing into the Yukon, where it breeds.* It is the most gregarious of all the duck tribe known to these islands; flocks of a hundred, closely bunched together, may be found at every turn by the traveler on the coast; nor is it particularly wild or shy, for every morning at St. George, whenever I chose to walk to the water's edge beneath the village, and less than a quarter of a mile distant, I could have a shot at fifty or a hundred of these birds, just as I had enjoyed such an opportunity in the early dawning previously; but it is a remarkably silent bird, and from it I never heard any cry whatever during the whole year; for it is about the island, unless the ice drives it away, throughout that entire period. It is a very social duck, solitary pairs never being seen away from the flock. The females seem to outnumber the males two to one; but, the strangest thing about it was my total inability, and that of the natives, too—for I offered an inordinate reward—to find its eggs or nest. It must breed about here, but whether deep in the rock interstices of the beach shingle, or flying by night to the high ridges inland, I am ignorant.

22. *Somateria Stelleri*. STELLER'S EIDER.

From the village hill at St. Paul, in May, 1872, I shot two specimens of this duck, and then not knowing as much about the seal-island cats as I speedily learned thereafter, the fresh stuffed specimens were literally torn into a thousand fragments by these abominable felines. It is, as I did not see it afterward during my residence on the group, a straggler, and nothing more.

23. *Graculus bicristatus*. RED-FACED CORMORANT; "OREEL."

As this bird of Pallas is found about the islands during the whole winter as well as the summer, despite the weather, perched on the sheltered bluffs, the natives regard it with a species of affection, for it furnishes the only

*Trans. Chicago Acad., i, 298.

supply they can draw upon for fresh meat, soups, and stews, always wanted by the sick; and, were these shags sought after throughout the year near as diligently as they are during the long spell of bitter temperature that occurs here in severe winters, driving other water-fowl away, they certainly would be speedily exterminated; yet, they are seldom shot, however, when anything else can be obtained. The terrible storms in February and March, when the wind "boogies" blow as tornadoes, are unable to drive the shag away, but all other water-fowl, even the big northern gulls, depart for the open water south. It comes under the cliffs to make its nest and lay—the earliest of the birds in Bering sea. Two eggs were taken from a bed on the reef, St. Paul island, June 1, 1872, nearly hatched, which is more than three weeks in advance of the other water-fowls, almost without exception. The nest is large, carefully rounded up, and built upon some jutting point or narrow shelf along the face of a cliff or bluff; in its construction sea-ferns (*Sertulariæ*), grass, etc., are used, together with a cement made largely of their own excrement.

The eggs are usually three in number, sometimes four, and, compared with the size of the bird, are exceedingly small. They are oval, of a dirty, whitish gray, green, and blue color, but soon become soiled; for, although this bird's plumage is sleek and bright, yet it is very slovenly and filthy about the nest—the dirtiest bird of all the north when we regard its domestic economy. The young come from the shell at the expiration of three weeks' incubation, without feathers and almost bare, even of down; they grow, however, rapidly, fed by the old birds, who eject the contents of their stomachs, such as small fish, crabs, and shrimps, all over and around the nest. In about six weeks the young cormorant can take to its wings, and, strange as it may seem, it is then fully as large and heavy as the parents; but it is not until the beginning of its second year that it shimmers out in the bright plumage and metallic gloss of the adult, wearing, during the first year of probation, a dull, dingy, drab-brown coat, with the brilliant red colors at the base of the bill, and gular sac, subdued.

This cormorant is a stupid and very inquisitive bird. It utters no sound whatever, except when flying over, about, or around a boat or ship, which seems to possess a magnetic power of attraction for them. When they are thus hovering and circling aloft in this method, they utter a low, droning croak. It cannot be called a bird of graceful action at any place, either on the wing, in the sea, or perched. Its flight is a quick beating of the wings, which are usually more or less ragged at the edge, with the neck and head stretched out full length horizontal to the axis of the body. So curious is it, that in flying, around and around again to satisfy itself, it comes close enough for an observer, should he stand erect in the bow of a boat, almost to touch it with his hand. It is very dirty on the rocks, and does not keep its nest in tidy trim like the gulls; but, in regard to its plumage, I frankly confess that I have sat for long intervals near a shelf whereupon fifteen or twenty of these birds were resting, absorbed in true admiration of the brilliant gloss and glittering sheen of their feathers; their coats really scintillate when in the sunlight with a confused blending of rich brownish and deep purple reflections, as though clothed in steel armor beautifully damascened.

24. *Diomedea brachyura*. SHORT-TAILED ALBATROSS.

This bird was the only real suggestion which arose to my mind, during my sojourn on the Pribilofs, of the past epoch of noted activity in the whale fisheries of the North Pacific and the Arctic; for, as I first discerned the large bulk and spread of the albatross prior to shooting, the natives clapped their hands and said, "You should have been here twenty years ago when, instead of this solitary example, you would have seen thousands." They came with the whalers, and disappeared, as they had done; but, as if prompted by legends among their kind, now and then an adventurous one comes north again and looks in vain for its whale food, or the skinned carcasses rather, turned adrift by the whalers; they were in sight of the island constantly, year in and year out, during that period of great whaling industry. The bird just cited, and this one only, was a solitary example of its kind observed by me. Two hundred miles to the southward, however, it is quite frequent about the Aleutian islands.

25. *Fulmarus glacialis*. RODGER'S FULMAR; "LUPUS."

This is the only representative of the *Procellariina* I have seen on or about the Pribilof islands. It repairs to the cliffs, especially on the south and east shores of St. George; comes very early in the season, and selects some rocky shelf, secure from all enemies save man, where, making no nest whatever, but squatting on the rock itself, it lays a single, large, white, oblong-oval egg, and immediately commences the duty and the labor of incubation. It is of all the water fowl the most devoted to its charge, for it will not be scared from the egg by any demonstration that may be made in the way of throwing rocks or yelling, and it will even die as it sits rather than take flight, as I have frequently witnessed. The fulmar lays about the 1st to the 5th of June. The egg is very palatable, fully equal to that of our domestic duck; indeed, it is somewhat like it. The natives prize them highly, and hence they undertake at St. George to gather their eggs by a method and a suspension supremely hazardous, as they lower themselves over cliffs five to seven hundred feet above the water. The sensation experienced by myself, when dangled over these precipices attached to a slight thong of raw-hide, with the surf boiling and churning three or four hundred feet below, and loose rocks rattling down from above, any one of which was sufficient to destroy life should it have struck me, is not a sensation to be expressed adequately by language; and, after having passed through the ordeal, I came to the surface perfectly satisfied with what I had called the improvidence of the Aleuts. They have quite sufficient excuse in my mind to be content with as few fulmar eggs as possible.* The "Lupus", laying so

* On the head at Tolstoi Mees, St. George, the natives pointed out to me a basaltic egg-shelf which marked the death of one of their townsmen. It occurred in the following singular manner: he the victim, had been very successful in securing a large basket of the first

early as the 1st of June, is the only rival that the cormorant has with reference to early incubation. It never flies in flocks; it pairs early, and is then exceedingly quiet. I have never heard it utter a sound, save a low, droning croak when disgorging food for its young. The chick comes out a perfect puff-ball of white down, and gains its first plumage in about six weeks. It is a dull, gray-black at first, but by the end of the season it becomes like the parents in coloration, only much darker on the back and scapularies. They are the least edible, with the exception of the cormorant, of all bird-food found about the islands; and, like others of their family, they vomit up the putrid contents of their stomachs at the slightest provocation.

26. *Stercorarius pomatorhinus*. POMARINE JÄGER; "RAZ-BOI-NIK."

This bird is a rare visitor, and is the only specimen which I procured, and was the sole representative seen on the islands of its class. I found it perched in a listless attitude on the high mossy uplands between Kamminista and Polavina Sopka.

27. *Stercorarius parasiticus*. PARASITIC JÄGER.

I have seen but a few of these birds, also; the four or five examples of this species, in my collection, were all that I sighted, therefore it may be rated as an infrequent visitor; it seems to be tired out, and is found upon the grassy uplands, where it will alight and stand dozing in an indolent attitude for hours. The natives say that it is fond of the berries of the *Empetrum*, and in confirmation of their statement I found the half-digested remains of this fruit therein. No one of the three species of *Stercorarius*, which I have in my hands, was observed to breed here.

28. *Stercorarius Buffoni*. LONG-TAILED JÄGER.

Also seldom seen, and the specimen in my collection is one of the only two I ever observed on the islands. When I discovered them, July 29, 1872, they were apparently feeding upon insects and the fruit of the *Empetrum nigrum*.

29. *Larus glaucus*. BURGOMASTER; "CHIKIE."

This large, handsome gull, the finest of its race, is restricted in its breeding to Walrus islet alone; although it comes sailing over and around all the islands, in easy, graceful flight, every hour of the day, and frequently late in the fall will settle down by hundreds upon the carcasses of the killing-grounds. But, at Walrus islet this bird is at home, and here lays its eggs in neat nests built of sea-ferns and dry grass, placed among the turfy tussocks on the center of the islet. No foxes are found there. It remains by the Pribylov islands during the whole season, though it is sometimes driven by the ice in search of open water, fifty to one hundred miles south; it invariably returns soon after the floe disappears.

The "chikie" lays as early as the 1st to the 4th of June, depositing three eggs only, within a week or ten days. These eggs are large, spherically oval, have a dark, grayish-brown ground, with irregular patches of darker brown-black. They vary somewhat in size, but the shape and pattern of coloring is more constant than in any other species up here.

The young *burgomaster* comes from the shell at the expiration of the regular three weeks' incubation, wearing a pure white thick coat of fluffy down, which is speedily supplanted by a brownish-black and gray plumage with which the bird takes flight, having nearly attained the size of the parent in less than six aggregate weeks. This dark coat changes during the next three months to one nearly white, with the lavender gray back of the adult; the legs change from a sickly, pale, grayish tone, to the rich yellow-gray of the mature condition, and the bill also passes from a dull brown color to a bright yellow, with a red spot at the top of the lower mandible. It has a loud, shrill, eagle-like scream, becoming more monotonous by its repetition; and it also utters a low, chattering croak while coasting. It is a very cleanly bird about its nest, and keeps its plumage in a condition of snowy purity. It is not very numerous; I do not think that there were more than five or six hundred nesting on Walrus islet at the time of my visit in 1872.

30. *Larus tridactylus* var. *Kotzebui*. PACIFIC KITTIWAKE; "CHORNI-NAUSEKIE GOVEROOSKIE."

This gull breeds here, by tens of thousands, in company with its first cousin, *Larus brevisrostris*, coming at the same time but laying a week or ten days earlier than its relative. In all other respects it corresponds in habit and is in just about the same number. It is a remarkably constant bird in plumage coloration when adult, for I have failed to observe the slightest variation among the great numbers here under my notice. In building its nest it uses more grass and less mud-cement than the *brevisrostris* does. The eggs are more pointed at the small end and lighter in the ground color, with numerous splotches of dark brown. The chick is difficult to distinguish with certainty from the *brevisrostris*, and it is not until two or three weeks have passed that any difference can be noted between them as to the length of bill and color of feet.

eggs of the season, and, desiring to continue the day's work, dispatched his wife back to the village with the oölogical burden, so that the basket might be emptied; meanwhile, in her absence, he put his little tethering-stake down anew, and, tying the rope of walrus or sea-lion hide to it, dropped over the brow of the cliff on it. A gaunt fox, which had been watching the proceedings, now ran up and fell to gnawing the rope, so taut and tense with the weight of the suspended egg-hunter below; the sharp teeth of Reynard, under the circumstances, instantly severed it, and the unfortunate native was dashed to the rocky shingle some 400 feet below, where his lifeless body was soon discovered. The poor fellow lost his life by having, at some earlier hour of the day, rubbed his yolk-smeared hands upon the sinewy strands, for at that place only did the hungry fox attack them.

31. *Larus brevirostris*. RED-LEGGED KITTEWAK; "GOVEROOSKIE."

This beautiful gull is one of the most elegant of all birds on the wing, and is, perhaps, as handsome as any known to the sight, when it rests; it seems to delight in favoring these islands with its presence, to the exclusion of other land, coming here by tens of thousands to breed. Certain it is that my specimens testify to its special abundance, and that it is by far the most attractive of all of its kind; the short, symmetrical bill, large hazel eye with crimson lids, and rich coral or vermilion-red legs and feet, contrast beautifully with the snowy-white plumage of its head, neck, lavender back, and under parts.

Like *Larus glaucus*, this bird remains about the islands during the whole season, coming on the cliffs for the purpose of nest-building, breeding by the 9th of May and deserting the bluffs when the birds are fully fledged and ready for flight, early in October. It is much more prudent and cautious than the auks and the murre, for its nests are always placed on nearly inaccessible shelves and points of mural walls, so that seldom can one be reached, unless a person is lowered down to it by a rope passed over the cliff.

Nest-building is commenced early in May, and completed, generally, not much before the 1st of July; it uses dry grass and moss cemented with mud, which it gathers at the fresh-water pools and ponds scattered over the islands. The nest is solidly and neatly put up; the parents work together in its construction most diligently and amiably. Two eggs are the usual number, although occasionally three will be found in the nest. If these eggs are removed the female will renew them like the "arrie", in the course of another week or ten days. They are of the size and shape of a common hen's egg, but covered with a dark gray ground spotted and blotched with sepia patches. Once in a while an egg will have on the smaller end a large number of suffused blood-red spots. Both parents assist in the labor of incubation, which lasts a trifle longer than the usual time—from twenty-four to twenty-six days. The chick comes out with a pure white downy coat, a pale whitish-gray bill and feet, and rests helplessly in the nest until its feathers grow. During this period it is a comical-looking object. The natives capture them, now and then, to make pets of, always having a number every year scattered through the village, usually tied by one leg to a stake at the doors of their houses, where they become very tame; and, it is not until fall, when cold weather sets in, that they become restless and willingly leave their captivity for the freedom of the air. This bird is remarkably constant in its specific characters. Among the thousands and tens of thousands of them, I have never observed any variation in the coloration of the bills, feet, or plumage of the mature birds, with one exception. This is a variety, seldom seen, however, in which the feet are nearly yellow, or much more yellow than red, and the edge of the eyelid is black instead of being normally scarlet; there is also a dark patch back of each eye in these odd specimens. The abnormal color of the feet is, probably, due to sheer accidental individual peculiarity, while the eye-patch and absence of bright color from the eyelids may depend upon the season.

32. *Colymbus arcticus*. BLACK-THROATED DIVER.

When surveying Zapadne, July, 1873, in measuring my angles on the beach, I came across the form of this bird, thrown up, nearly dead, by the surf, under my feet. It is the only one I have seen upon the islands, and I called the attention of the old wisecracks of the village to it. Whereupon, after much deliberation and guttural Aleutian vocalization, they informed me that they had never noticed it before around the island, though one aged man declared to the contrary, and submitted his minority report with great emphasis and much gravity. At all events, it is seldom seen here. The bird in question was a fine adult specimen, and it is interesting to observe that it is the true *Colymbus arcticus* and not var. *pacificus*, which might naturally have been expected.

33. *Podiceps griseigena*. RED-NECKED GREBE.

As in the case of the diver above cited, the present specimen is a typical form rather than a North American variety. It was the only specimen seen during my residence on the island. It has, however, been observed by the natives heretofore, though they affirm that it is uncommon; also, a straggler, in my opinion.

34. *Fratercula corniculata*. HORNED PUFFIN; "EPATEA."

My first impression when I saw one of these odd-looking birds, with its large shovel-like, lemon-yellow and red bill, as it sat squatted in glum silence on the rocky cliff perches, was one of great amusement, and it stared back at me in stolid wonder as I laughed. Of all birds in these latitudes, it seems to have been fashioned with a special regard to the fantastic and ludicrous. This mormon, in common with one other species, *M. cirrhata*, comes up from the sea in the south to the cliffs of the islands about the 10th of May, always in pairs, never coming singly to, or going away from, the Pribilof's in flocks. It makes a nest of dried sea-ferns, grass, and moss, slovenly laid together, far back in some deep or rocky crevice, where, when the egg is laid, it is ninety-nine times out of a hundred cases, inaccessible; nothing but blasting-powder would open a passage to it for man. It has this peculiarity: it is the only bird on these islands which seems to quarrel forever and ever with its mate. The hollow reverberations of its anger, scolding, and vituperation from the nuptial chamber, are the most characteristic sounds, and indeed the only ones that come from the recesses of the rocks. No sympathy need be expended on the female. She is just as big and just as violent as her lord and master. The nest contains but a single egg, large, oblong, oval, pure white; and, contrary to the custom of the gulls, arries, and choochkies, when the egg is removed the sea-parrot does not renew it, but deserts the nest, perhaps locating elsewhere. The young chick I have not been able to get until it becomes

fledged and ready for flight in August; then it does not differ materially from its parent. Only the absence of the auricular plumes can be noted. The *Epatka* leaves the island about the 10th of September, spending, I believe, the rest of the time at sea. Except when quarreling in the nesting caverns, this bird is very quiet and unobtrusive. It does not come in large numbers to the islands, for it breeds everywhere else in Bering sea, and along the northwest coast as far south as Cross sound. Its flight is performed with quick and rapid wing-beats, in a straight and steady course. There is no difference between the sexes as to shape, size, or plumage.

35. *Fratercula cirrhata*. TUFTED PUFFIN; "TAWPORKIE."

This bird comes to the island at about the same time as its cousin, just preceding, and resembles the "Epatkie" in its habits, generally, being quite as conspicuous a domestic scold. It lays a single large white egg of a rounded oval shape. I was not able to see a newly-hatched chick, owing to the retired and inaccessible breeding places; for, whenever I could find an egg I seized upon it instantly, not daring to wait for the culmination of hatching. I think that Walrus islet, if visited frequently during the close of the hatching-season, would afford an opportunity to study the young, because the nests, which were the only ones from which I could get eggs, are more easy of access. The young tawporkie, six weeks old, resembles the parents exactly, only the bill is lighter colored and the plumes on the head are incipient. Walrus islet is the only place where the birds can be daily seen and watched with satisfactory results. I took eggs from over 30 nests in July. The natives say that when it is mating, its cries sound like the growling of a bear, as they issue from far down under the rocks which cover its nest.

36. *Phaleris psittacula*. PARROQUET AUK; "BAILLIE BRÜSHKIE."

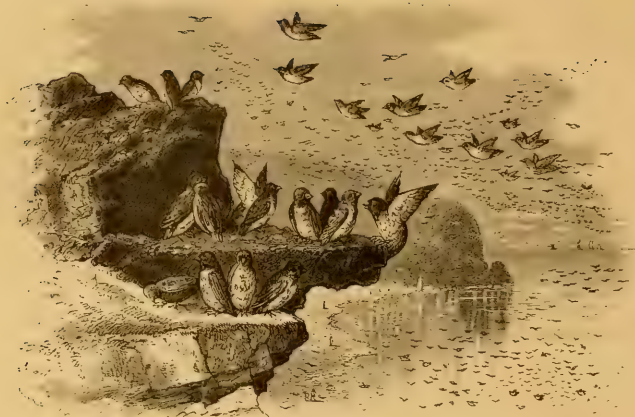
This quaintly-beaked bird is quite common on the Pribylov group, and can be obtained at St. George in large numbers. It comes to the islands early in May, mute and silent, locating its nest in a deep chink or crevice of some inaccessible cliff, where it lays a single egg and rears its young. It is very quiet and undemonstrative during the pairing season, its only note being a low, sonorous, vibrating whistle. Like *Simorhynchus cristatellus*, it will breed in company with the "choochkie", but will not follow that lively relative back upon the uplands, for the "baillie brüshkie" is always found on the shore line, and there only. The egg, which is laid upon the bare earth or rock, is pure white, oblong-ovate, measuring $1\frac{1}{2}$ by $2\frac{1}{2}$ inches. To obtain it is exceedingly difficult, owing to the bird's great caution in hiding and care in selecting some deep winding crevice in the face of a cliff. At the entrance to this nesting cavern, the parents will sometimes squat down and sit silently for hours at a time, if undisturbed. It does not fly about the islands in flocks, and seems to lead an unassuming, independent life by itself, caring nothing for the society of its kind. The young, when first hatched, I have not seen, but by the 10th or 15th of August they may be coming out for the first time from their secure retreats, and taking to wing as fully fledged as their parents. They leave the islands from the 20th of August to the 1st of September, and go out upon the North Pacific for the winter, where they find their food, which consists of *amphipoda* and fish-fry. I have never seen one among the thousands that were around me on the islands, opening bivalve-shells, such as mussels, as stated by a German author. It feeds at sea, flying out every morning and returning in the afternoon to its nest and mate. As in the case of the puffins nothing else than dynamite, or similar agency, could open the basaltic crevices in which the bird hides; and, of course, resort to this action would also destroy the egg; therefore, I was not able to gather much more than a baker's dozen of their eggs, though I could see at any time a thousand of the birds.

37. *Simorhynchus cristatellus*. CRESTED AUK; "CANOOSKIE."

This fantastic bird, the plumed knight of the Pribylov islands, is conspicuous by reason of its curling crest and bright crimson bill. It makes its appearance in early May, and repairs to chinks and holes in the rocky cliffs, or deep down below a huge boulder and rough basaltic shingle, to deposit its egg upon the bare earth or rock, making no nest whatever; and, like the "brüshkie", so well do these birds succeed in secreting their charge, that although I was constantly upon the ground where several thousand pairs were laying, I was unable successfully to overturn the rocks under which they hide, and get more than four perfect eggs, the sum total of many hundred attempts. The note of the "canooskie", while mating, is a loud, clanging, *honk*-like sound; at all other seasons they are as silent as the grave. The crested auk lays but one egg, and the parents take turns, I am inclined to believe, in the labor of hatching and in that of feeding their young. The egg is rough, pure white, but with frequent discolorations, and, compared with the size and weight of the bird, is disproportionately large. It is an elongated oblong-oval, the smaller end being quite pointed. Length, 2.10; width, 1.40. I have not seen a chick, nor could I get any notes upon its appearance from the natives, but I have shot the young as they came out for the first time from their dark, secure, hiding places, full fledged, with the exception of their distinctive crest, being by this time, the 10th to 15th of August, as large as the old birds, and of the same color and feathering. The "canooskie", like its cousin, the "choochkie", has no sexual variation in size or plumage; males and females, to all external view, are precisely alike. The bright crimson bill varies, however, considerably in color, and in its strength and curve, the slenderer bill being confined, as far as I could see, to the young birds; some old ones had very pointed beaks also.

38. *Simorhynchus pusillus*. LEAST, OR KNOB-BILLED AUK; "CHOOCHKIE."

I take pleasure in writing the biography of this little bird, which is the most characteristic and the most



"CHOOCHKAMIE EDOOT!"



THE FULMAR'S NICHE.



"EPATKIE" AND "TAWPORKIE."

ORNITHOLOGICAL SKETCHES ON THE PRIBYLOV ISLANDS, BY THE AUTHOR.

interesting one of all the water-fowl frequenting the Pribylov islands, for it comes here every summer by millions to breed. It is comically indifferent to the proximity of man, and can be approached almost within an arm's length before taking flight, sitting squatted upright and eyeing you with its peculiar "watch-ring" optics, that wear an air of great wisdom combined with profound astonishment.

Usually, about the 1st or 4th of May, every year, the "choochkie" makes its first appearance around the islands for the season, in small flocks of a few hundred or thousand, hovering over and now and then alighting upon the water, sporting one with the other in apparent high glee, making an incessant, low, chattering sound; but they are only the van to flocks that by the 1st or 6th of June have swarmed in upon the islands, like those flights of locusts which staggered my credulity on the great plains of the west. They frequent the loose stony reefs and boulder-bars on St. Paul, together with the cliffs on both islands; and what is most remarkable, they search out an area over five miles square of basaltic shingle on St. George island, which lies back and over, inland from the north shore-line. To the last position they come in greatest numbers; they make no nest, but lay a single egg far down below among the loose rocks, or they deposit it deep within the crevices or chinks in the faces of the bluffs.

Although, owing to their immense numbers, they seem to be in a state of great confusion, yet they pair off and conduct all of their billing and cooing down under the rocks, on the spot chosen for incubation; making, during this interesting period, a singular croaking sound more like a "devil's fiddle" than anything I have ever heard outside of a city's limits.

To walk over their breeding-grounds, at this season, is highly interesting and most amusing, as the noise of hundreds and thousands of these little birds, which are directly under your feet, gives rise to an endless variation of volume of sound, as it comes up from the stony holes and caverns below; while the birds come and go, in and out, whistling around your head, comically blinking and fluttering.

The male birds, and many of the females, regularly leave the breeding-grounds in the morning and go off to sea, where they feed on small water-shrimps and sea-leas, returning to their nests and sitting partners, in the evening. It is one of the sights on St. George, this early morning departure and the early evening return of the myriads of choochkies to their nests. The *Simorhynchus* lays a single pure white egg, exceedingly variable in size and shape, usually oblong-oval with the smaller end pointed. I have several specimens almost spherical, and others drawn out into an elongated ellipse; but the oblong oval, with the pointed smaller end, is the prevailing type. Compared with the size and weight of the little bird, the egg is excessively large. Average length, 1.55; width, 1.12. The length of the bird, 3 inches; width, 2 inches. The general aspect of the egg is very much like that of the pigeon's, excepting the roughness of the shell. The chick is covered with a thick, uniform, dark, grayish-black down, which is speedily succeeded by feathers, all much darker than those of the parent, when it takes its flight from the island for the year, six weeks after hatching. Old birds feed their young by disgorging, never carrying anything up in their bills, and when the young leave, they are just as large and just as heavy as their parents. I am strongly inclined to think that the male bird feeds the female while incubating, but have not been able to verify this observation, as they are always hidden from sight at the time, and they cannot be told apart by size or color.

39. *Lomvia troile*, var. *californica*. MURRE; "GUILLEMOT."

Limited numbers of the Californian guillemot are found occasionally perched on the cliffs with the *arrie*; they can only be distinguished at a short distance by a practiced eye, for they resemble their allies so closely and conform so strictly to their habits, that it will be but repeating the description of the *L. arra*, given below, should I attempt it. The largest gathering in any one place, that I have seen on the islands, of these birds, was a squad of about fifty on the high bluffs at St. George, but they are generally scattered by ones, twos, and threes among thousands and tens of thousands of the *arra*.

40. *Lomvia arra*. THICK-BILLED GUILLEMOT; "ARRIE."

This is the only egg-bird that has the slightest economic value to man on the Pribylov islands. The bird itself is in bodily size a true counterpart of our ordinary barn-yard duck, only it cannot walk or even waddle as the domestic swimmer does. It lays a single egg, large and very fancifully colored; a bluish-green ground, shot with dark-brown mottlings and patches, but exceedingly variable as to definite size and color. The outline of the egg is pyriform, sometimes more acute, again more ovate. It is the most palatable of all the varieties found on the islands, except the fulmar; and when perfectly fresh I can testify to its practical equality with our deservedly prized hen's eggs; it never has any disagreeable flavor whatever, for the birds feed entirely upon marine crustacea. I have never found any fish in their craws.

This bird is the true *arra* of Pallas, a name derived undoubtedly from its striking similarity to the harsh sound uttered by the bird. It is present in immense multitudes, countless flocks, principally surrounding St. George island, although Walrus islet is fairly covered by them. They appear very early in the season, but are slow in laying, not beginning usually until the 18th or 25th of June. I feel quite well assured that these birds do not migrate far from Bering sea during the most severe winters, and in the milder hyemal seasons numbers of them are around the islands during the entire year. They lay their eggs upon the points and narrow shelves, on the faces

of the cliff-fronts to the islands, straddling over the eggs, side by side, as thickly as they can crowd, making no nests. They quarrel desperately, but not by scolding; it is spirited action, and so earnestly do they fight, that all along below the high bluffs of the north shore of St. George, when I passed thereunder during the breeding-season, I stepped over hundreds of dead birds which had fallen and dashed themselves to death upon the rocks while elinched in combat with their rivals; for they seize one another in mid-air and hang with their strong mandibles so savagely to each other's skin and feathers, that, with the swift whirring of their powerful wings they are blinded to their peril, and strike the earth beneath ere they realize their danger and immediate death. Their curious straddling, whereby the egg is warmed and hatched, lasts nearly twenty-eight days, and then the young comes out with a dark, thick coat of down, which is supplanted by the plumage and color of the old bird, in less than six weeks. They are fed by the disgorging parents, seemingly without a moment's intermission, uttering, all the while between their gulps, a hoarse, harsh, croak, lugubrious enough.

The males and females have no sexual distinction as to size, shape, and plumage; their snow-white breasts are vividly contrasted with their shiny, chocolate necks; backs and wing-coverts are always black, while beneath them is a continuation of the pure white of the abdomen. They fly with an energetic action of their short, pointed pinions, a nervous, quick, and well-sustained flight, never swerving or deviating from their straight course after they once rise. They plump into the water like stones; and, unless the sea is running, it is difficult for them to take to wing from a smooth surface; this gives them little concern, however, inasmuch as they dive so freely.

It is fitting, perhaps, that I should say in connection with the final discussion of this bird, which closes my list of the avifauna peculiar to these strange islands, that its singular habit of circling St. George as it flies in the morning and in the evening, during the mating season, produces a very extraordinary demonstration as to the exceeding number of their kind; for instance at St. George island, while the females begin to sit over their eggs toward the end of June and first of July, at regular hours in the morning and in the evening, the males go flying around and around the island, in great files and platoons, always circling against, or quartering on, the wind; and they make in this way, during a sustained period of hours at a time, a dark girdle of birds more than a quarter of a mile broad and thirty miles long, flying so thickly together that the wings of one fairly strike those of the other; and, as they go, they whirl in swift, revolving, endless succession, during the periods just mentioned. This is a dress-parade of ornithological power, which I challenge the world to rival; certainly the Pribylov islands possess distinctive exhibitions of mammalia and aves, which are unrivaled.*

CLOSING MEMORANDA.—The above list of birds found on the Pribylov islands by myself in the seasons of 1872-'76, inclusive, is perhaps not exhaustive in its application to the straggling visitors; indeed, I think it more than likely that several names will be added by those who may pay the subject further attention; I do not enumerate the *Aegiothii* which I shot there June 21, 1872, because the specimens were so badly damaged by my coarse ammunition as to defy proper skinning; therefore I made alcoholics of them, and those collections have been mislaid since my return. Also the natives say that a small brown owl in the summer breeds on St. George, and the large Arctic or Snowy *Nyctea* is occasionally taken at either island. I saw none while there.

27. CATALOGUE OF THE FISHES OF THE PRIBYLOV GROUP.

[A memorandum of the fishes collected at the Pribylov islands, 1872-'73, by Henry W. Elliott.]

Anarrhichas lepturus. Rare; seals drive them off.

Gadus morrhua. "TREESCA."† Rare; seals drive them off.

Hippoglossus vulgaris. "POLTOOS." Common; only large ones caught.

Melletes papilio.‡ "KALOG." Common; a beach cottoid.

* I have said, in my notes of introduction to this monograph, that I have been obliged to confine myself in its preparation entirely to my own observations and field-work; when, therefore, I speak as above of such immense myriads of water-fowl, I fear that some kindly critic may declare truly I remind him of worthy Master Gerard, who, in 1636, speaking of Irish birds, announced that the common barnacle goose, *Branta leucopsis*, was produced in a wonderful fashion, and proceeded to describe its growth from the mollusk, *Pentelasmis anatifera*, in the most circumstantial manner, prefacing this amazing story by a voucher couched in these words: "What our eyes have seen, and hands have touched, we shall declare;" also he gives a figure showing the metamorphosis going on from the shell into the goose! This cirripodous origin of the bird in question has not been agreed to, in spite of the weight of evidence, but strangely enough its generic name has been given and retained in accordance with the fable, and the barnacle itself is still called by conchologists "the five-pointed goose bearer"! or *Pentelasmis anatifera*.

† The St. George natives have caught codfish just off the Tolstoi head early in June, but it is a rare occurrence; by going out two or three miles from the village at either island, during July and August, the native fisherman usually captures large halibut; not in abundance, however. The St. Paul people, as well as their relatives on St. George, fish in small, "one hole" bidarkies; they venture together in squads of four to six; one man alone in the kyack is not able to secure a "bolshoi poltoos"; the method, when the halibut is hooked, is to call for your nearest neighbor in his bidarka, who paddles swiftly up; you extend your paddle to him, retaining your own hold, and he grasps it, then you seize his in turn, thus making it impossible to capsize, while the large and powerfully struggling fish is brought to the surface between the canoes, and knocked on the head; it is then towed ashore and carried, in triumph, to the lucky captor's house.

‡ New genus and species determined by Dr. Tarleton H. Bean, based upon my type specimen.

Cottus niger.* "KALOG." Common; a beach cottoid.

Muraenoides maxillaris.* Rare; a beach fish.

Liparis gibbus.* Rare.

Gasterosteus cataphractus. Common; found in lagoon.

Gasterosteus pungitius. Common; found in lagoon.

28. NOTES ON THE INVERTEBRATES.

FIELD NOTES UPON THE ENTOMOLOGY, MALACOLOGY, BOTANY, ETC.—Touching a specific list of the insect life here, I regret exceedingly that my collections covering this head, as well as those which include the two following orders, have been unaccountably mislaid; consequently, I shall not reproduce the hastily and naturally imperfect memoranda which I made of them when they were packed on St. Paul island in 1872.

LIMITED NUMBER OF INSECTS ON THE PRIBYLOV ISLANDS.—The variety and abundance of entomological life here is not great, with the marked exception of a few species of beetles and flesh flies on the killing-grounds. The green and golden *carabus* is, however, found distributed in great numbers all over the islands.

SCANTY MOLLUSCAN REPRESENTATION ON THE SEAL-ISLANDS.—I qualify my statements made at the introduction to this memoir, by saying that the terrestrial and littoral forms of mollusca on and around the Pribylov group are scant in number; but I believe that the pelagic life in this respect will be found quite rich. For instance, I never saw any live specimens of the *Neptuniana*. All the shells of this character collected had been cast up by the surf and were empty. The largest live gasteropod that came under my notice was a species of *Murex*. As the above sketch plainly shows, the conchologist has not a very extensive field here, though doubtless search bent directly to this end would develop a much better catalogue. If a dredge were patiently and energetically used around these islands, I am very sure that many new forms would be found, which give us tangible evidence of their being, by land and beach hunting for them. My time was so thoroughly engrossed on the rookeries that I had not a single day to spare during the only season of the year in which I could work with my dredge. The rough water and weather that prevail when the seals are not about, prevented my following up the mollusks in this manner.

SEA EGGS, OR SEA URCHINS: TOXOPNEUSTES.—Frequently the natives have brought a dish of sea-urchins' viscera for our table, offering it as a great delicacy. I do not think any of us did more than to taste it. The native women are the chief hunters for *Echinoidea*, and during the whole spring and summer seasons they may be seen at both islands, wading in the pools at low water, with their scanty skirts high up, eagerly laying possessive hands upon every "bristling" egg that shows itself. They vary this search by poking, with a short-handled hook, into holes and rocky crevices for a small cottoid fish, which is also found here at low water in this manner. Specimens of this "kalog," which I brought down, declared themselves as representatives of a new departure from all other recognized forms in which the sculpin is known to sport; hence the name, generic and specific, *Melletes papilio*.

The "sand-cake", *Echinarachnius* sp., is also very common here.

FINE TABLE CRAB: CHIONOECETES.—By the 28th of May to the middle of June, a fine table crab, large, fat, and sweet, with a light, brittle shell, is taken while it is skurrying in and out of the lagoon as the tide ebbs and flows. It is the best-flavored crustacean known to Alaskan waters; they are taken nowhere else, at St. Paul; and when on St. George I failed to see one. I am not certain as to the accuracy of the season of running, viz, 28th May to 15th June, inasmuch as that one of my little note-books on which this date is recorded turns out missing at the present writing, and I am obliged to give it from memory. The only economic shell-fish which the islands afford is embodied in the *Chionoecetes opilio* (?). The natives affirm the existence of mussels here in abundance when the Pribylov group was first discovered, but now only a small supply of inferior size and quality is to be found.

MARINE SKELETON-MAKERS: BEAUTIFUL WORK OF SEA-FLEAS.—The service which swarms of *Amphidodons crustaceans* rendered me in cleaning the bones of birds, fish, and even seals, cannot be too highly eulogized. Only in that small bight, however, known as the "Cove", near the village of St. Paul, could I get the work done; because at no other spot on the Pribylov islands was the sea-water quiet enough. By taking common hard-bread boxes, which the company's agent gave me from the store, and substituting a slatted cover, I would, by rock-ballasting, sink this with fifteen or twenty bird carcasses in the water here at low tide. When a single flow and ebb had taken place, I had the box taken promptly out, never failing to find every skeleton perfectly polished, yet entirely articulated; the most delicate bones in a fish's head or fins were intact. The strong food which the blubber of the seal carcasses afford acts so as to gorge and stupefy these little ghouls of the ocean, for I did not succeed well at all with such attempts. The bones of *Callorhinus* would have to lay submerged in the cove for weeks, sometimes, ere they were eaten free of flesh, fat, etc.; then, when taken out, they would be sadly discolored by the salt water, turned black and dingy in streaks and sections.

*New species.

29. NOTES ON THE PLANTS.

THE PRINCIPAL VEGETATION OF THE PRIBYLOV GROUP: ABSENCE OF TREES.—That spruce trees can be made to live transplanted from indigenous localities to the barren slopes of the Aleutian islands has been demonstrated; but in living, these trees scarcely grow to any appreciable degree. Evergreens were transferred to Oonalashka, when Veniaminov was at work there in 1830-35. They are still standing and keep green, yet the change which such a long lapse of time should produce by growth has been as difficult to determine as it is to find evidence of increased altitude to the mountains around them since these Sitkan trees were planted, with pious hope, at their feet fifty years ago. Though I can readily understand why the salmon berries of Oonalashka should not do well on the seal-islands (still I think they would at the Garden cove of St. George), nevertheless I believe that the whortleberries of that section would thrive at many places, if carefully transplanted to these localities, on the southern slopes of Cemetery ridge at Zapadnië, the southern slopes of Telegraph hill, and eastern fall of Tolstoi peninsula down to the shore of the lagoon. They might also do well set out at picked places about the Big lake and on Northeast point, around the little lake thereon. If these bushes really thrive here, they would be the means of adding greatly to the comfort of the inhabitants; for the Oonalashka whortleberry is an exceeding pleasant, juicy fruit, large and well adapted for canning and preserving. Having less sunshine here than at Illoolik, it may not ripen up as well flavored, but would, I think, succeed. The roots of the plants when brought up from Oonalashka in April or early May, should be kept moist by wet moss wrappings, from the moment they are first taken up until they are reset, with the tops well pruned back, on the Pribylov islands. The experiment is surely worth all the trouble of making, and I hope it will be undertaken.

THE CHARACTERISTIC "TALNEEK": *SALIX*.—The only suggestion of a tree found growing on the Pribylov group is the hardy "talneek" or creeping willow; there are three species of the genus *Salix* found here, viz, *reticulata*, *polaris*, and *arctica*; the first named is the most common and of largest growth; it progresses exactly as a cucumber vine does in our gardens; as soon as it has made from the seed a sprout of six inches or a foot upright from the soil, then it droops over and crawls along prostrate upon the earth, rocks, and sphagnum; some of the largest talneek trunks will measure eight or ten feet in decumbent length along the ground, and are as large around the stump as an average wrist of man. The usual size, however, is very, very much less; while the stems of *polaris* and *arctica* scarcely ever reach the diameter of a pencil case, or the procumbent length of two feet.

Although *Rubus chamaemorus* is a tree shrub, and is found here very commonly distributed, yet it grows such a slender, diminutive bush, that it gives no thought whatever of its being anything of the sort. The herbs, grasses, and ferns tower above it on all sides.

FAMILIAR AND LOVELY FLOWERING PLANTS.—Perhaps no one plant that flowers on the seal-islands is more conspicuous or abundant than is the *Saxifraga oppositifolia*; it rises over all localities, rank and tall in rich locations, to stems scarcely one inch high on the thin, poor soil of hill summits and sides; densely cespitose, with leaves all imbricated in four rows; and flowers almost sessile. I think that at least ten well-defined species of this order, *Saxifragaceæ*, exist on the Pribylov group. The *Ranunculaceæ* are not so numerous; but, still, a buttercup growing in every low slope, where you may chance to wander, is always a pleasant reminder of pastures at home; and, also, a suggestion of the farm is constantly made by the luxuriant inflorescence of the wild mustard, *Cruciferae*. The chickweed, *Caryophyllaceæ*, is well represented, and also the familiar dandelion, *Taraxacum palustre*. The lichens, *Thallophytes*, and the mosses, *Musci*, are in their greatest exuberance, variety, and beauty here; and myriads of yellow poppies, *Papaveraceæ*, are nodding their graceful heads in the sweeping of the wind—they are the first flowers to bloom, and the last to fade.

The chief economic value rendered by the botany of the Pribylov islands to the natives, is the abundance of the basket-making rushes, *Juncaceæ*, which the old "barbies" gather in the margins of many of the lakes and pools.

MUSHROOMS AT ST. PAUL.—The fungoid growths on the Pribylov islands are abundant and varied, especially in and around the vicinity of the rookeries and the killing-grounds. On the west slope of the Black Bluffs at St. Paul, the mushroom, *Agaricus campestris*, was gathered in the season of 1872 by the natives, and eaten by one or two families in the village, who had learned from the Russians to cook them nicely. These seal-island mushrooms have deeper tones of pink and purple red in their gills than do those of my gathering in the states. I kicked over many large spherical "puff-balls", *Lycoperdons*, in my tundra walks; myriads of smaller ones, *Lycoperdon cinereum* (?), cover patches near the spots where carcasses have long since rotted, together with a pale-gray fungus, *Agaricus finiputris*, exceedingly delicate and frosted exquisitely. Some ligneous fungi, *Clavaria*, will be found attached to the decaying stems of *Salix reticulata* (creeping willows). The irregularity of the annual growing of the agarics, and their rapid growth when they do appear, make their determination excessively difficult; they are as unstable in their visits as are several of the *Lepidoptera*. The cool humidity of climate during the summer season on the Pribylov islands is especially adapted to the mysterious, but beautiful growth of these plants—the apotheosis of decay. The coloring of several varieties is very bright and attractive, shading from a purplish scarlet to a pallid white.

DIVERSE ELEGANCE AND SERVICES OF THE CRYPTOGAMS.—The range and diverse beauties of the numerous mosses and lichens on these Pribylov islands must serve as an agreeable and interesting study to any one who has the slightest love for nature. They undoubtedly formed the first covering to the naked rocks, after those basaltic foundations had been reared upon and above the bed of the sea—bare and naked cliffs and boulders, which with calm intrepidity presented their callous fronts to the ice-wedging chisels of the Frost King; rain, wind, and thawing moods destroyed their iron-bound strongness; particles larger and finer washed down and away made a surface of soil which slowly became more and more capable of sustaining vegetable life. In this virgin earth, says an old author—

The wind brings a small seed, which at first generates a diminutive moss, which, spreading by degrees, with its tender and minute texture, resists, however, the most intense cold, and extends over the whole a verdant velvet carpet. In fact, these mosses are the medicines and the nurses of the other inhabitants of the vegetable kingdom [in the North]. The bottom parts of the mosses, which perish and moulder away yearly, mingling with the dissolved but as yet crude parts of the earth, communicate to it organized particles, which contribute to the growth and nourishment of other plants; they likewise yield salts and unguinous phlogistic particles for the nourishment of future vegetable colonies. The seeds of other plants, which the sea and winds, or else the birds in their plumage, bring from distant shores, and scatter among the mosses.

Then the botanist needs no prompting when he observes the maternal care of those mosses that screen the tender new arrivals from the cold, and imbue them with the moisture which they have stored up, and—

Nourish them with their own oily exhalations so that they grow, increase, and at length bear seeds, and afterward dying, add to the unguinous nutritive particles of the earth, and at the same time diffuse over this new earth and mosses more seeds, the earnest of a numerous posterity.

The following species of algæ were collected in 1872-'73, by the author:

MELANOSPERMÆ.

(All called "Kapooosta"; natives.)

Fucus vesiculosus. Common; anchored in large beds.

Nereocystis Lütkeanus. ("SEA-OTTER RAFTS.") Common.

Alaria esculenta. Common. This has been used by the Pribylov natives as an article of food relish.

Chordaria flagelliformis. Common.

Elachista fucicola. Common.

RHODOSPERMÆ.

Polysiphonia. Rare.

Melobesia polymorpha. Common.

Melobesia lichenoides. Common.

Delesseria. Rare.

Peyssonnelia. Common.

Collishamnion. Common.

CHLOROSPERMÆ.

Cladophora uncialis. Common.

Conferva capillaris. Common (fresh-water lakes and pools).

Nostochinea. Common (fresh-water lakes and pools).

Ulva latissima. Common.

The above names do not pretend to specify the entire list that will be found here, but they simply indicate those varieties which are dominant.

LUXURIANCE AND VARIETY OF THE SEA-WEEDS.—The extent and luxuriance, variety and beauty of the algæ forests of these waters of Bering sea which lave the coasts of the Pribylov group, call for more detail of description than space in this memoir will allow, since anything like a fair presentation of the subject would require the reproduction of my water-colored drawings. After the heavier gales, especially the southeasters in October, if the naturalist will take the trouble to pace the sand-beach between Lukannon and Northeast point of St. Paul island, he will be rewarded by a memorable sight. He will find thrown up by the surf a vast windrow of kelp along the whole eight or ten miles of this walk, heaped, at some spots, nearly as high as his head; the large trunks of *Melanosperma*, the small, but brilliant red and crimson fronds of *Rhodosperra* interwoven with the emerald green leaves of the *Chlorosperra*. The first-named group is by far the most abundant, and upon its decaying, fermenting brown and ocher heaps, he will see countless numbers of a buccinoid whelk, and a limnæa, feeding as they bore or suck out myriads of tiny holes in the leaf fronds of the strong growing species.

SEA-ANEMONES AND STAR-FISHES.—*Actinias* or sea-anemones occur, together with numerous starfishes; many jelly-fishes are also interwoven and heaped up with the "kapooosta" or sea-cabbages just referred to; also, a quantity of rosy "sea-squirts" and yellow "sea-cucumbers".

CONFEROID RUGS AND CARPETS.—On the old killing-fields, on those spots where the sloughing carcasses of

repeated seasons have so enriched the soil as to render it like fire to most vegetation, a silken green *Conferæ* grows luxuriantly. This terrestrial algaoid covering appears here and there, on these grounds, like so many door-mats of pea-green wool. That confervoid flourishes only on those spots where nothing but pure decaying animal matter is found. An admixture of sand or earth will always supplant it by raising up instead those strong growing grasses which I have alluded to elsewhere, and which constitute the chief botanical life on the killing-grounds.

PRECAUTIONS NECESSARY TO SUCCESSFUL BOTANICAL WORK.—If the following hints will serve to save the next collection of botanical specimens that may be gathered on these islands, it is not superfluous to print them here. Let the collector take a large amount of bibulous paper, and a small room all to himself; in the center of this apartment place a little stove, with an "organ" pipe; then fit up a series of broad library shelves around the walls from the floor to the ceiling; upon these shelves he will be enabled, aided by a low, steady fire, to dry the intensely juicy leguminosæ, and several other exceedingly thick and watery stemmed plants so peculiar to the Pribylov islands, thus save their color, and prevent them from turning black; a little fire must be kept in the room all the time that the collection is in the process of curing, and also after it is ready for use, ere leaving the islands. When shipped it should be hung up, well boxed, in the fire-room of the steamer; or else, if the voyage happens to be unusually foggy and dilatory, it will sweat in the hold, or cabin even, and be entirely destroyed before San Francisco is reached. I give these remarks advisedly and feelingly, for I lost the result of a hard season's work in this line of collection. By not appreciating these desiderata, another naturalist may come here as I did, be charmed with the flora, as well as the fauna, and after gathering hundreds of specimens at the expense of weary weeks of constant tramping, lose them all.

COURTESIES EXTENDED TO NATURALISTS.—The Alaska Commercial Company afforded me every facility that I had the ingenuity to ask for—giving me the unrestricted use of their men, their buildings, and their experience. Had it been the direct labor of the company instead of that in which I was engaged, I could not have had more attention paid to me and my pursuits. They stand ready to do as much again for any other accredited naturalist who may follow in my path over the Pribylov islands while they have control; this they will possess for nearly another decade hence.

30. VENIAMINOV ON THE RUSSIAN SEAL-INDUSTRY AT THE PRIBYLOV ISLANDS.

[Translated by the author, from Veniaminov's *Zapiski*, etc.; St. Petersburg, 1842; vol. ii, pp. 568.*]

INDISCRIMINATE SLAUGHTER BY THE FIRST DISCOVERERS.—From the time of the discovery of the Pribylov islands up to 1805 (or, that is, until the time of the arrival in America of General Resanov), the taking of fur-seals on both islands progressed without count or lists, and without responsible heads or chiefs, because then (1787 to 1805, inclusive) there were a number of companies, represented by as many agents or leaders, and all of them vied with each other in taking as many as they could before the killing was stopped. After this, in 1806 and 1807, there were no seals taken, and nearly all the people were removed to Oonalashka.

PARTIAL CHECK ORDERED.—In 1808 killing was again commenced; but the people in this year were allowed to kill only on St. George. On St. Paul hunters were not permitted this year or the next. It was not until the fourth year after this that as many as half the number previously taken were annually killed. From this time (St. George 1808, and St. Paul 1810) up to 1822, taking fur-seals progressed on both islands without economy and with slight circumspection, as if there was a race in killing for the most skins. Cows were taken in the drives and killed, and were also driven from the rookeries to places where they were slaughtered.

It was only in 1822 that G. Moorayev (governor) ordered that young seals should be spared every year for breeding, and from that time there were taken from the Pribylov islands, instead of 40,000 to 50,000, which Moorayev ordered to be spared in four successive years, no more than 8,000 to 10,000. Since this, G. Chestyakhov, chief ruler after Moorayev, estimated that from the increase resulting from the legislation of Moorayev, which was so honestly carried out on the Pribylov islands, that in these four years the seals on St. Paul had increased to double their previous number, (*that*) he could give an order which increased the number to be annually slain to 40,000; and this last order or course directed for these islands, demanded as many seals as could be got; but with all possible exertion hardly 28,000 were obtained.

POOR RESULTS.—After this, when it was most plainly seen that the seals were, on account of this wicked killing, steadily growing less and less in number, the directions were observed for greater caution in killing the grown seals and young females, which came in with the droves of killing-seals, and to endeavor to separate, if possible, these from those which should be slain.

PARTIAL CHECKS AGAIN ORDERED.—But all this hardly served to do more than keep the seals at one figure or number, and hence did not cause an increase. Finally, in 1834, the governor of the company, upon the clear (or "*handsome*") argument of Baron Wrangel, which was placed before him, resolved to make new regulations respecting them, to take effect in the same year (1834), and, following this, on the island of St. Paul only 4,000 were killed, instead of 12,000.

* The italics are mine, and my translation is nearly literal, as might be inferred by the idiom here and there.—H. W. E.

On the island of St. George the seals were allowed to rest in 1826 and 1827, and since that time greater caution and care have been observed, and headmen or foremen have kept a careful count of the killing.

From this it will be seen that no anxiety or care as to the preservation of the seal-life began until 1805 (*i. e.*, with the united companies).

It is further evident, that all half measures, seen or not seen, were useful no longer, as they only served to preserve a small portion of the seal-life, and only the last step (1834) with the present people or inhabitants has proved of benefit. And if such regulations of the company continue for fifteen years (*i. e.*, until 1849), it may be truly said that then the seal-life will be attracted quite rapidly, under the careful direction of headmen, so that in quite a short time a handsome yield may be taken every year. In connection with this subject, if the company are moderate and these regulations are carried out, the seal-life will serve them and be depended upon, as shown in this volume, Table No. 2.

IDEAS OF THE OLD NATIVES.—Nearly all the old men think and assert that the seals which are spared every year (“*zapooskat kotor*”), *i. e.*, those which have not been killed for several years, are truly of little use for breeding, lying about as if they were outcasts or disfranchised. About these seals, they show that after the seals were spared, they were always less than they should be, as, for instance, on the island of St. George, after two years of saving or sparing of 5,500 seals, in the first year they got, instead of 10,000, or 8,000 as expected, only 4,778.

WHY THE SEALS DIMINISHED.—But this diminution, which is shown in the most convincing manner, is due to wrong and injustice, because it would not have been otherwise with any kind of animals—even cattle would have been exterminated—because a great many here think and count that the seal-mother brings forth her young in her third year, *i. e.*, the next two years after her own birth. As it is well shown here, the spared seals (“*zapooskie*”) were not more than three years old, and therefore it was not possible to discern the correct and true numbers as they really were. Taking the females killed by the people, together with all the seals which were purposely spared, it was seen that the seal-mothers did not begin to bear earlier than the fifth year of their lives. Illustrative of this is the following:

(a) On the island of St. George, after the first “zapooka”, in 1828, the killing of five-year-old seals was continued gradually up to five times as many as at first. With those of five years old the killing stopped. Then next year twelve times as many six-year-olds were observed on the islands, as compared with their number of the last year, and with or in the seventh year came seven times as many. This shows that females born in 1828 did not begin to bear young until their fifth year, and become with young accordingly; that the large ones did not appear or come in six years (from 1828), as is evident, for in the fifth year all the females did not bring forth.

(b) It is known that the male seals cannot become “seecatchies” (*adult bulls*) earlier than their fifth or sixth year; following this, it may be said that the female bears earlier than the fourth year.

(c) If the male seal cannot become a bull (“seecatchie”) earlier than the fifth year, then, as Buffon remarks, “animals can live seven times the length of the period required for their maturity”; therefore, a “seecatch” cannot live less than thirty years, and a female not less than twenty-eight.*

VENIAMINOV'S BELIEF THAT FEMALES CANNOT BEAR YOUNG UNTIL FOUR YEARS OLD.—Taking the opinion of Buffon for ground in saying, that animals do not come to their full maturity until one-seventh of their lives has passed, it goes also to prove that the female seal cannot bear young before her fourth year.

It is, without doubt, a fact that female seals do not begin to bear young before their fifth year, *i. e.*, the next four years after the one of their birth, and not in the third or fourth year. That, however, is not the rule, but the exception. To make it more apparent that females cannot bear young in their third year, consider two-year-old females, and compare them with “seecatchie” (*adult bulls*) and cows (*adult females*), and it will be evident to all that this is impossible.

Do the females bear young every year; and how often in their lives do they bring forth?

HIS DOUBTS ON THE SUBJECT.—To settle this question is very difficult, for it is impossible to make any observations upon their movements; but I think that the females, in their younger years (or prime), bring forth every year, and as they get older, every other year; thus, according to people accustomed to them, they may each bring forth in their whole lives from ten to fifteen young, and even more. This opinion is founded on the fact that never (except in one year, 1832) have an excessive number of females been seen without young; that cows not pregnant hardly ever come to the Pribylov islands; that such females cannot be seen every year. As to how large a number of females do not bear, according to the opinions and personal observations of the old people, the following may be depended upon with confidence: not more than one-fifth of the mature or “effective” females are without young; but to avoid erroneous impressions or conflicting statements between others and myself, I have had but one season (“*trayt*”) in which to personally observe and consider the multiplication of seals.

* “This remark is sustained by the observation of old men, and especially by one of the best Creoles, Shiesneekov, who was on the island of St. Paul in 1817, and who knows of one “seecatch” (known by a bald head), which in that time had already a large herd of cows or females, surrounded and hunted by a like number of females and strong, savage old bulls; therefore, it may be safely thought that this bull did not get his growth until his fifth year, and at this time he could not have been less than ten years old. And this same bull came every year to the island and the same place for fifteen years in succession, up to 1832, and it was only in the later years that his harem grew smaller and smaller in number.”

HIS THOUGHTS ON BIRTH OF PUPS.—There is one more very important question in the consideration of the breeding or the increase of seals, and that is, of the number of young seals born in one year, how many are males; and is the number of males always the same in proportion to the females?

Judging from the "holluschickie" accumulated from the "zapoooska" in 1822-'24 on the island of St. Paul, and in 1826-'27 on the island of St. George, the number of young males was widely variable; for example, on the island of St. Paul, in three years, 11,000 seals were spared, and in the following three years there were killed 7,000, *i. e.*, about two-thirds of the number saved; opposed to this, on the island of St. George, from 8,500 seals spared in two years, less than 3,000 were taken—hardly one-third.

Why this irregularity? Why should more young males be born at one time, and at another less? Or why should there be years in which many cubs do not bear young?

According to the belief of the people here, I think that of the number of seals born every year, half are males and as many females (*i. e.*, the other half).

TABLE NO. I: ITS USE.—To demonstrate the above-mentioned conditions of seal-life, the table No. I has been formed of the number of seals annually killed on the Pribylov islands, from 1817 to 1838 (when this work was ended).

From this it will be seen that—

1. No single successive year presents a good number of seals killed, as compared with the previous year; the number is always less.

2. The annual number of seals killed was not in a constant ratio.

3. And, therefore, in the regular hunting-season there is less need or occasion, during the next fifteen years, to demand the whole seal kind.

4. Fewer seals were killed in those years, generally, following a previous year in which there were larger numbers of the "holluschickie"; that is, when the young males were not completely destroyed, and more were killed when the number of "holluschickie" was less.

5. The number of "holluschickie" is a true register or showing of the number of seals; *i. e.*, if the "holluschickie" increase and exist like the young females, and conversely.

6. "Holluschickie" break from the (common) herd and gather by themselves no earlier than the third year, as seen in the case of the spared seals on the islands of St. George and St. Paul, the latter from 1822-'24 to 1835-'37, inclusive; the former from 1826-'27.

7. The number of seals killed on the island of St. George, after two years ("zapoooska") was resumed, and gradually increased to five times as many.

8. In the fifth year from the first "zapoooskie" (*or saving*) it became possible to count or reckon on the number remaining, and six-year-olds began to appear twelve times as numerous, and seven-year-olds came in numbers sevenfold greater than their previous small number; and, therefore, the number of three-year-old seals was quite constant.

9. If on the island of St. George, in 1826-'27, the seals had not had this rest ("zapoooska"), and the killing had been continued, even at the diminished ratio of one-eighth, in 1840 or 1842 there would not have been a single seal left, as appears by the following table:

	Seals.		Seals.
1825.....	5,500	1833.....	1,260
1826.....	4,400	1834.....	1,190
1827.....	3,520	1835.....	1,040
1828.....	2,816	1836.....	850
1829.....	2,468	1837.....	700
1830.....	2,160	1838.....	580
1831.....	1,890	1839.....	500
1832.....	1,554	1840.....	400

10. RESULTS OF THE "ZAPOOSKA".—Following two years of "zapoooska" (*saving*), the seal-life is enhanced for more than ten years, and the loss sustained by the company in the time of "zapoooskov" (about 8,500) is made good in the long run. The case may be thus stated: if the company had not spared the seals in 1826-'27 they would have received, from 1826 to 1838 (twelve years), no more than 24,000, but by making this zapoooska regulation for two years, they got in ten years 31,576, and, beyond this, they can yet take 15,000 without another, or any, zapoooska.

11. And in this case, where such an insignificant number of seals was spared on St. George (about 8,500), and in such a short time (two years), the result was at once significant every year; that is, three times more appeared than the number spared. The result, therefore, must be large annually on the island of St. Paul, where, in consequence of the last orders or directions of the governor, already four years of saving have been in force, in which time over 30,000 seals have been left for breeding.

On this account, and in conformity with the above, I here present a table, a prophecy of the seals that are to come in the next fifteen years from 7,060 seals saved on the island of St. Paul in 1835.

On the island of St. Paul, at the direction of the governor, a "zapooosk" or saving was made of 12,700 seals; that is, before the year 1834 there were killed 12,700 seals, and on the following year, if this saving had not been

made, according to the testimony of the inhabitants, no more than 12,200 seals would or could have been taken from the islands, it being thought that this number (12,200) was only one twenty-fifth of the whole; but instead of killing 12,200, only 4,052 were taken, leaving in 1835, for breeding, 8,118 fresh young seals, males and females, together.

In making this hypothetical table of seals that are to come, I take the average killing, that is, one-eighth part, and proceed on the supposition that the number of saved seals will not be less than 7,060.

In the number of 7,060 seals we can calculate upon 3,600 females; that is, a slight majority of males. With the new females born under this "zapooka" I place half of those born the first year, and so on.

Females, in the twelve or eighteen years next after their birth, must become less in number from natural causes, and by the twenty-second year of their lives they must be quite useless for breeding.

Of the number of seals which may be born during the next four years of "zapooka", or longer, we may take half for females. This number is included in the table, and the males, or "holluschickie", make up the total.

TABLE NO. II: ITS SHOWING.—From the table II observe that—*

1. Old females, that is, those which in 1835 were capable of bearing young, in 1850 must be canceled (minus). They probably die in proportion of one-eighth of the whole number every year.

2. For the first four years of "zapooka", until the new females begin to bear, their number will be generally less.

3. A constant number of seals will continue during the first six years of their "zapooka"; in twelve, these seals will double; in fourteen years they will have increased threefold; and after fifteen years of this "zapooka" or saving of 7,060, in the first year, 24,000 may be taken from them; in the second, 28,000; in the third, 32,000; in the fourth, 36,000; in the fifth, 41,000; thus in five years more than 160,000 can be taken. Then, under the supervision of persons who will see that one-fifth of the seals be steadily spared, 32,000 may be taken every year for a long time.

4. Moreover, from the production of fifteen years' "zapooka", there can be taken from 60,000 to 70,000 "holluschickie", which, together with 160,000 seals, makes 230,000.

5. If this "zapooka" for the next fifteen years is not made for the seal-life, diminution will certainly ensue, and all this time, with all possible effort, no more than 50,000 seals will be taken.

Here it should be said that this hypothetical table of the probable increase of seals is made on the supposition of the decrease of females, and an average is taken accordingly. Furthermore, on the island of St. Paul, in 1836-'37, instead of 7,900 seals being killed, but 4,860 were taken. Hence, it follows that these 1,500 females thus saved in two years, and which are omitted from the table, will also make a very significant addition to the incoming seals.†

TABLE I, PART II.—Bishop Veniaminov's Zapieska, etc., showing the seal-catch during the period of gradual diminution of life on the islands, from 1817 down to 1837.

Taken from—	1817.	1818.	1819.	1820.	1821.	1822.	1823.	1824.	1825.	1826.	1827.
Saint Paul island	47,860	45,932	40,300	39,700	35,750	28,150	24,100	19,850	24,600	23,250	17,750
Saint George island	12,328	13,924	11,915	10,520	9,245	8,319	5,773	5,550	5,500	†	1,950
Total	60,188	59,856	52,225	50,220	44,995	36,469	29,873	25,400	30,100	23,250	19,700

Taken from—	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	1836.	1837.
Saint Paul island	18,450	17,150	15,200	12,950	13,150	13,200	12,700	4,052	4,040	4,220
Saint George island	4,778	3,661	2,834	3,064	3,296	3,212	3,051	2,528	2,550	2,582
Total	23,228	20,811	18,034	16,014	16,446	16,412	15,751	6,580	6,590	6,802

Grand total for Saint Paul island	464,259
Grand total for Saint George island	114,665
Total catch during nineteen years of diminution	578,924

*The reader, in following the calculations of the Bishop, as exhibited by this table, must not forget to bear in mind, as he runs it over, that it is arranged with a sliding scale of increase, that counts steadily down from 1840 to 1849; and also, a sliding down scale of decrease, by reason of natural death-rates, that works steadily across these figures of increase just specified.—H. W. E.

†I translate this chapter of Veniaminov's without abridgment, although it is full of errors, to show that while the Russians gave this matter evidently much thought at headquarters, yet they failed to send some one on to the ground, who, by first making himself acquainted with the habits of the seals from close observation of their lives, should then be fitted to prepare rules and regulations founded upon this knowledge. These suggestions of Veniaminov were, however, a vast improvement on the work as it was conducted, and they were adopted at once; but it was not until 1845 that the great importance of never disturbing the breeding-seals was recognized.—H. W. E.

† Left to breed.

TABLE II.—Showing the number of seals that will visit the island in the next twenty-two years—a prophecy made by Veniaminov in 1834.

Years.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.
	1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.	1843.	1844.	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.
1 1835	3,600	0	0	0	0	900	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,000	800	400	200	.....	.....	.....
2 1836	0	3,150	0	.....	.....	.....	785	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,000	700	300	100	.....	.....
3 1837	0	2,755	.....	.....	.....	.....	680	918	918	918	918	918	918	918	918	918	900	600	300	10	.....
4 1838	2,410	.....	.....	.....	.....	600	805	805	805	805	805	805	805	805	805	805	750	500	300
5 1839	2,110	.....	.....	.....	.....	450	700	700	700	700	700	700	700	700	700	700	600	400
6 1840	1,845	.....	From old arrivals..	450	615	615	615	615	615	615	615	615	615	615	600	500	500
	New. 900	.....	From newcomers..	152	200	200	200	200	200	200	200	200	200	200	150	100	100
7 1841	1,580	.....	.....	.....	315	525	525	525	525	525	525	525	525	525	500	500
	Total new..	1,985	.....	From new ones ..	420	572	572	572	572	572	572	572	572	572	572	500	500
8 1842	1,355	.....	.....	.....	325	451	451	451	451	451	451	451	451	451	451	451
	Total new..	2,930	.....	From new ones ..	650	909	909	909	909	909	909	909	909	909	909	909	909
9 1843	1,130	.....	.....	258	376	376	376	376	376	376	376	376	376	376	376
	Total new..	3,768	.....	From new ones ..	880	1,188	1,188	1,188	1,188	1,188	1,188	1,188	1,188	1,188	1,188	1,188	1,188
10 1844	900	.....	.....	225	300	300	300	300	300	300	300	300	300	300	300
	Total new..	4,423	.....	From new ones ..	1,020	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440
11 1845	725	.....	.....	180	241	241	241	241	241	241	241	241	241	241	241
	Total new..	5,275	.....	From new ones ..	1,240	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687	1,687
12 1846	580	.....	.....	125	190	190	190	190	190	190	190	190	190	190	190
	Total new ..	6,225	.....	From new ones ..	1,500	1,994	1,994	1,994	1,994	1,994	1,994	1,994	1,994	1,994	1,994	1,994	1,994
13 1847	450	.....	.....	100	143	143	143	143	143	143	143	143	143	143	143
	Total new ..	7,560	.....	From new ones ..	1,810	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420	2,420
14 1848	250	.....	.....	61	83	83	83	83	83	83	83	83	83	83	83
	Total new ..	9,083	.....	From new ones ..	2,254	2,908	2,908	2,908	2,908	2,908	2,908	2,908	2,908	2,908	2,908	2,908	2,908
15 1849	100	.....	.....	25	40	40	40	40	40	40	40	40	40	40	40
	Total new ..	10,654	.....	From new ones ..	2,550	3,187	3,187	3,187	3,187	3,187	3,187	3,187	3,187	3,187	3,187	3,187	3,187
Total ♀	3,600	3,150	2,755	2,410	2,110	2,745	3,565	4,285	4,898	5,323	6,000	6,805	7,990	9,333	10,754	12,369	14,153	16,148	18,216	20,820	20,105	19,358
Total ♂	3,460	3,150	2,755	2,410	2,110	2,745	3,435	4,215	4,102	5,378	6,000	6,795	8,010	9,267	10,746	12,331	14,147	16,102	18,184	20,824	20,095	19,342
All	7,060	6,300	5,510	4,820	4,220	5,490	7,000	8,500	9,700	10,700	12,000	13,600	16,000	18,600	21,500	24,700	28,300	32,250	36,400	41,640	40,200	38,700

From this table behold that—

a. Every fifteen years, from 3,600 females, there can be received in sixteen years 24,700 seals; in sixteen years still more; and in twenty years 41,640.

b. In the twenty-first year the incomes begin to diminish, provided that if in the meantime, or the following sixteen years, a certain number of young seals are not left to breed; and if every year a known number are left to breed, then in all following years the yield will never be less than 20,000 every year.

TABLE III.—Calculation as to the taking of the seals on the island of St. George, made up from two years, and based upon that experience. (1827–28.)

Year.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	Grand total
	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	1836.	1837.	
1.—1826	2,200	.....	.....	.....	.....	450	700	700	700	700	700	700	.....
2.—1827	Breeding..	2,050	.....	.....	.....	360	600	600	600	600	600	600	.....
3.—1828	Light	.....	1,700	1,500	1,200	1,000	700	550	400	250	100	50	.....
Females	.....	.....	.....	.....	.....	1,450	1,760	1,850	1,700	1,550	1,400	1,350	.....
"Holluschickie"	.....	.....	.....	.....	.....	1,760	1,800	1,700	1,500	1,500	1,500	1,400	.....
Total	2,200	2,050	1,600	1,500	1,200	1,450	3,520	3,650	3,400	3,050	2,900	2,750	29,270

The actual taking of seals was as follows:

	Seals.		Seals.
In 1828	4,778	In 1834	3,051
In 1829	3,661	In 1835	2,528
In 1830	2,834	In 1836	2,550
In 1831	3,084	In 1837	2,582
In 1832	3,296		
In 1833	3,212	Total	31,576

From this table it will be seen that up to 1838 my calculation makes a yield of 29,270 seals; while the actual result was 31,576; making a difference of 2,306.

The difference determines that the hypothesis upon which the table is based is correct.

31. VENIAMINOV'S ACCOUNT OF THE DISCOVERY OF THE PRIBYLOV ISLANDS.*

LOCATION AND DISCOVERY.—Under the name of the Pribylov islands are known two small islands lying in Bering sea, between 56° and 57° north latitude, and 168° and 170° west longitude.

Stöörman G. Pribylov, who had been on the American coast for some time and observed the indications of islands in Bering sea, became convinced of their existence; and the embarrassed circumstances of his company finally induced him to attempt their discovery. * * * He was considered one of the best navigators of that region. * * * For a long time he was in close vicinity to one of the islands subsequently named after him, but three weeks elapsed before he could get a sight of the same through the surrounding fog. At last fate or good fortune, coming to the assistance of an enterprising man, raised the curtain of the fog, and the eastern headland of the island (*Tolstoi Mees*) nearest to the Aleutian archipelago rose up before the navigators, filling them with inexpressible joy. This island was named by them, after their ship, "St. George". The "predovchik" (or leader) of the expedition, Yeafeem Popov, with all the hunters on the vessel, landed and remained on the newly-discovered island; but the vessel, failing to find any harbor, returned to winter at the Aleutian islands, carrying away a few fur-seals and sea-otters. The hunters who remained on the island of St. George sighted, on the 29th of June (*Justinian calendar*) of the following year (the day of the apostles Peter and Paul), an island to the northward, which they at once named "Peter and Paul", but the name of Peter was subsequently dropped from common usage. These islands have borne, since their discovery, a variety of names. At first they were called simply "Novie" (*new*); the Pribylov; and the "predovchik" named them Laibdevskie (the principal shareholder of the company was Laibdev). Shellikov named them "Zubovie" (*this was the name of the minister of interior at that time, who was a partner and shareholder also*); but among the hunters they attained the appellation of "Saivernie" (*northern*) on account of their situation north of Oonashka, and "Kotovnie", or Seal-islands. At the present time (1838) they are often called simply "The Islands" in the colonies (*i. e., Alaska and Kamchatka*). The name of Pribylov, as the one most justly applied, should be used throughout.

The change from summer to winter is abrupt. The number of clear days is exceedingly small. The sun is rarely visible between the 1st of May and the middle of August, and during nearly all that time it is impossible to see beyond the distance of a few fathoms ("*sajens*"). For this reason these islands are so difficult to find, that out of twenty ships only one succeeded in reaching them by a straight course. They are visible only during easterly winds for a brief period, * * * but the constant winds probably counteract the exhalations (*from the carcasses*). Under the present circumstances (1838) it would be impossible to remedy the trouble; to kill the animals at a greater distance from the village would require an increased number of laborers to pack the skins and meat; and if the carcasses were burned, the smoke would probably drive away the animals, while there is neither soil nor labor sufficient to bury or to burn them. The latter process would also deprive the inhabitants of their fuel, as they employ bones and putrified meat for cooking purposes, in place of wood.

The food supply is ample even to luxury, especially on the island of St. Paul. The labor is severe, but only temporary, and the inhabitants have a great deal of time for themselves. A majority of them employ their leisure hours very well, teaching themselves and their children the rudiments of the Russian and Aleutian grammar, and with such success that of late, under the administration of the Creole, Shiesneekov, nearly all the males on St. Paul have learned to read. These people are not only richer, but more active and energetic in their labor as well as in their pious faith, than are their Aleutian brethren elsewhere; and altogether the inhabitants of St. Paul may be called the first among the Aleuts.

On account of the value of fur-seal and sea-otter skins shipped from these islands since their discovery, and up to the present time (1838), they might be called the "Golden islands", without estimating the 125,000 blue foxes and 50,000 sea-otters shipped from there during the first thirty years (*after their discovery*).

THE VILLAGES AS THEY WERE IN 1838.—The first and most important settlement was situated at the southwestern extremity of the island (*Zapadnie*). The second, which is the present site, on the southeastern point (*Village Hill*). In the village of to-day (1838) there is a wooden chapel in honor of the apostles Peter and Paul, erected in 1821, and nicely ornamented in the interior, at the expense of the resident Aleuts; a dwelling for the manager; a store, and a magazine, all built like the church, of neatly-dressed drift logs. In addition to this, there is a "kozarnie" (*barracoon*) built after the fashion of Aleutian "oölaghamul" (*or large, communistic, underground habitations*) houses, a few private dwellings, and thirteen native barrabaras. A small wind-mill has been added of late.

* Translated, by the author, from Bishop Innocent Veniaminov's work, *Zapieska ob Ostrorah Oonashkenskaho Otdayla*: St. Petersburg, 1840. The only Russian treatise upon the subject found. Those selections most pertinent to the subject are introduced above in my translation. The italics are mine, and explanatory.—H. W. E.

The inhabitants subsist principally upon the flesh of fur-seals and sea-lions, with the addition of roots and a little flour. In the summer time, between June and September, halibut and some cod are caught around the shore, and altogether the living of these Aleuts is excellent and even luxurious, compared with that of their neighbors. The station is supplied with provisions and trading-goods from Sitka, the ship arriving annually in June and July. As there is no safe harbor, these vessels must receive and discharge their cargoes under sail.

In former years, up to 1820 or 1821, those islands were under the control of the Oonalashka office. The manager of St. Paul was, until the year 1834, also in charge of St. George, visiting the latter island every spring in a bidarkie; and, though these navigators cannot see from one island to the other, their journeys have been usually successful, with the exception of three occasions—twice the small craft missed the island of St. George (*going from St. Paul*), and pushed on to the coast of the Alaskan peninsula, where they finally secured a landing; and in the third instance, the bidarra was lost altogether.

On the island of St. George there was no bay or entrance, with the exception of a shallow bight near the village (*Zapadnie*). This settlement contains a wooden chapel erected in honor to St. George, log buildings occupied by the agent of the company and his servants, and a number of barrabaras. * * * The inhabitants are, however, in less comfortable circumstances than those of St. Paul. Of provisions, they have a great abundance of sea-lion meat, sea-birds and their eggs. The eggs are obtained by lowering a person over the precipitous cliffs, by means of seal-skin ropes. Many perish in this attempt from the friction of the strands against the sharp edges of the rocks; and occasionally the foxes have been known to gnaw off the ropes on which the hunters were suspended.

Occasionally shocks of earthquakes* still remind us of the volcanic origin of the Pribylov islands. Very heavy ones occurred repeatedly in April on both islands, when many overhanging cliffs were thrown into the sea. The inhabitants of the Pribylov islands belong to the parish of Oonalashka, the priest of which is obliged to visit them once every two years (*to marry, baptize, etc.*). These islands were not known before the year 1786; mate G. Pribylov,† then in the service of a swan-hunting company, first, in the Russian name, found them, but at the same time he was not the first discoverer, because, as before said (Part I, chap. 1,) on one of them (southwest side of St. Paul) signs, such as a pipe, brass knife-handle, and traces of fire, were found, indicating that people had been there before, but not long, as places were observed where the grass had been burned and scorched. But if we can believe the Aleuts in what they relate, the islands were known to them long before they were visited by the Russians. They knew and called them "Ateek", after having heard about them.

Egag-dah-geek, a son of an Oonimak chief by the name of Ah-kak-nee-kak, was taken out to sea in a bidarkie by a storm, the wind blowing strong from the south. He could not get back to the beach, nor could he make any other landing, and was obliged to run before the wind three or four days, when he brought up on St. Paul island, north from the land which he had been compelled to leave. Here he remained until autumn, and became acquainted with the hunting of different animals. Elegant weather one day setting in, he saw the peaks of Oonimak. He then resolved to put to sea, and return to receive the thanks of his people there; and, after three or four days of traveling, he arrived at Oonimak, with many otter tails and snouts.‡

NO VEGETATION ON THE ISLANDS.—The islands were both at first without vegetation, with the exception of St. Paul, where there was a small *talneek* creeping along on the ground; and on St. George, if we believe the accounts of the first ones there to see, nothing grew, even grass, except on the places where the carcasses of dead animals rotted. In the course of time both islands were covered with grass, a great part of it being of the sedge kind. On them are two varieties of berries, etc., etc.

EARLY STATUS OF THE COLONISTS.—The Aleuts serving the company here sustained the following relations between themselves and it, to wit: each of them worked without solicitation and at whatever was found, and to which they were directed, or at that which they understood. Payment for their toil was not established by the day

*These shocks probably occurred in 1796-'97, when Boga Slov island was raised, in April or May of that year, from the bed of Bering sea, 170 miles directly south of St. George. Such earthquakes were also characteristic of those sub-tropical fur-seal islands, Juan Fernandez and Masafuera.—H. W. E.

†Gehrman Pribylov, the discoverer of the seal-islands, was a native of "old Russia"; his father was one of the surviving sailors of the "St. Peter", which was wrecked, with Bering in command, November 4, 1741, on Bering island. The only reference, which I can find to him, is the vague incidental expressions used here and there, throughout an extended series of lengthy Russian letters published by Tschmainov, as illustrative of the condition of affairs in regard to the Russian American Company. Pribylov was, when cruising, in 1783-'86, for the rumored seal-grounds, merely the first mate of the sloop "St. George". The captain and part owner was one M. Zubov, who was a member of a trading association then quite well organized in Alaska, and known as the "*Laidedev Lastochkin*" company. It does not appear that Pribylov took any part in the business of sealing, other than that of remaining in charge of the company's vessels. He died while in discharge of these duties, at Sitka, March, 1796, on his ship, "The Three Saints" ("*Tre Svyatoi*").

Pribylov, himself, called these islands of his discovery, after Zubov; but the Russians then, and soon, unanimously indicated the group by its present well deserved title, "*Ostrovie Pribylova*."—H. W. E.

‡Here Veniaminov says that he does feel inclined to believe this story, as the peaks of Oonimak can be seen occasionally from St. Paul. I have no hesitation in saying that they were never observed by any mortal eye from the Pribylov group. The wide expanse of water between these points, and the thick, foggy air of Bering sea, especially so at the season mentioned in this story above, will always make the mountains of Oonimak invisible to the eye from St. Paul island. A *mirage* is almost an impossibility; it may have been much more probable if the date was a winter one.—H. W. E.

or by the year, but in general for each thing taken by them or standing or put to their credit by the company; for instance, especially the skins of animals, the teeth of walrus, barrels of oil, etc. These sums, whatever they might be, were placed by the company to their credit, for all general hunting and working was established or fixed for the whole year fairly. The Aleuts, in general, received no specific wages, though they were not all alike or equal, there being usually three or four classes.

In these classes, to the last or least, the sick and old workmen were counted, although they were only burdens, and therefore they received the smaller shares, about 150 rubles, and the other and better classes received from 220 to 250 rubles a year. Those who were zealous were rewarded by the company with 50 to 100 rubles. The wives of the Aleuts, who worked only at the seal-hunting, received from 25 to 35 rubles.*

ANIMALS ON THE PRIBYLOV ISLANDS.—Foxes and mice. Sometimes the ice brings bears and red foxes. The bears were never allowed to live, since they could not be made useful; and also the red foxes, as they would only spoil the breed already existing, with regard to color of the fur.

Fur-seals, sea-lions, hair-seals, and a few walrus are the only animals that may be said to belong to the Pribylov islands.

BIRDS.—The *guillemots* (or *arries*); gulls; puffins; crested, horned, and white-breasted auks; snow-finches; geese (two kinds); a few kinds of *Tringa*; sea-ducks, black and gray. Most of these birds come here to lay, and with them *jiggers*, hawks, owls, and "chikees" (big *Larus glaucus*), and the albatross is frequently to be seen around the beaches.

Sea-otters became scarce generally in 1811, and in the next thirty years extinct.

The fur-seals ("sea-cats") astonish us by their great numbers, as they gradually come up on to their breeding-places, notwithstanding harsh and foolish treatment of them, continued almost half a century (until 1824), without mercy.

RUSSIAN WASTE AND SLAUGHTER.—In the first years, on St. Paul island, from 50,000 to 60,000 were taken annually, and on St. George from 40,000 to 50,000 every year. Such horrible killing was neither necessary nor demanded. The skins were frequently taken without any list or count. In 1803, 800,000 seal-skins had accumulated, and it was impossible to make advantageous sale of so many skins; for in this great number so many were spoiled that it became necessary to cut or throw into the sea 700,000 pelts. If G. Resanov (our minister to Japan) had not given this his attention, and put himself between the animals and this foolish management of them, it appears plainly to me that these creatures would have long ago changed for the worse.

NO RECORDS PRIOR TO 1817: EARLY DRIVING.—Of the number of skins taken up to 1817, I have no knowledge to rely upon, but from that time and up to the present writing, I have true and reliable accounts, which I put in the appendix to this volume. From these lists it will be seen that still in 1820, on both islands, there were killed more than 50,000 seals, viz, on St. Paul, 39,700; and on St. George, 10,250. There were eye-witnesses to the reason for this diminution of the seals, and it is only wonderful, beside, that they are still existing, as they have been treated almost without mercy so many years. The cows produce only one pup each, every year. They have known deadly enemies, and also are still exposed to many foes unknown. From this killing of the seals they steadily grew less, except on one occasion, which was on St. George island, where an opportunity was given suddenly to kill a large number; but the circumstances do not seem to be important. On one occasion a drive was made of 15,000 male and female seals, but the night was dark, and it was not practicable to separate the cows from the males, and they were, therefore, allowed to stand over until daylight should come. The men put in charge of the herding of the drove were careless, and the seals took advantage of this negligence, and made an attempt to escape by throwing themselves from the bluffs over the beach near by into the sea; but, as this bluff was steep, high, rough, and slippery, they fell over and were all injured. Now, for the first time, great numbers of seals were missed, and why, it was not significant or apparent; but in the following year, instead of the appearance and catch of 40,000 or 50,000, less than 30,000 were killed and taken, and then, too, the numbers of seals were known to diminish, and in the same way, only greater, on the other island. For instance, in the first years, on the island of St. George, the seals were only five or six times less than on St. Paul, but in 1817 they were only less than one-fourth; but in 1826 they were almost one-sixth again.

The diminution of seals there (St. Paul) and on the other island, from 1817 to 1835, was very gradual and visible every year, but not always equal.

The killing of seals in 1834, instead of being 80,000 or 60,000, was only 15,751 from both islands (St. Paul, 12,700; St. George, 3,051).

SUM TOTAL OF FUR SEALS TAKEN.—In the first thirty years (according to Veniaminov's best understanding),

* Compare this annual payment of the Russians with the cash settlement made every year by the Alaska Commercial Company, the present lessee of these islands, as indicated by a prior chapter on the condition of the business there.—H. W. E.

there were taken "more than two and a half millions of seal-skins"; then, in the next twenty-one years, up to 1838, they took 578,924. During this last taking, from 1817 to 1838, the skins were worth on an average "no more than 30 rubles each" (\$6 apiece).*

A great many sea-otters (*Enhydra marina*) were found on St. Paul island at first, and as many as 5,000 were taken from the island, but years have passed since one has been seen in the vicinity, even, of the islands.

32. HISTORY OF THE ORGANIZATION OF THE RUSSIAN-AMERICAN FUR COMPANY.

PRIBYLOV ISLANDS PASS INTO ITS CONTROL.—The mention made by Veniaminov, of the occupation of the Pribylov islands immediately after their discovery by a score or so of rival traders and their butchering suites, is authentic; it is not necessary to paint the selfish details of the mercenary crews, as I find them drawn by several Slavic chroniclers. In 1799 the whole territory of Alaska went into the control of the Russian-American Company, and a picture of this organization, which managed affairs on the seal-islands for sixty-seven long years, may be interesting in this connection.

CAUSES OF EARLY RUSSIAN FUR-TRADE.—The accidental circumstances connected with Bering's ill-fated voyage in 1741, were the first direct means of impetus given to Russian exploration and trade in the waters of the North Pacific and Bering sea; the skins of the sea-otter and the blue foxes, in especial, which the survivors took from Bering island back to Kamtchatka and Russia, sold for such high prices that it stimulated a large number of hardy, reckless men to scour those seas in search of fur-bearing lands. This trade, thus commenced, was for many years carried on by individual adventurers, each of whom acted alternately as a seaman, as a hunter, and as a trader, solely for his individual profit.

INCEPTION OF THE RUSSIAN-AMERICAN COMPANY.—At length, however, an association was formed in 1785, among a number of Siberian merchants, to carry on the fur-trade of the North Pacific. It received the protection and encouragement of the Empress Catherine, who bestowed upon it many valuable privileges. G. Shellikov was the ruling spirit of the corporation. Catherine's son and successor, Paul, was at the outset of his reign, disposed to abolish these imperial advantages extended to this company, by his mother, on account of the heartless conduct of affairs in Alaska. Reasons of state, however, caused him to abandon this resolution; and he issued a "ukase" dated July 8, 1799, which granted to those united merchants, aforesaid, a charter, under the title of the Russian-American Company, that gave them exclusive use and control, for a period of twenty years, of all the coasts of America on the Pacific and the islands in that ocean, from Bering straits to the 55th degree of south latitude, together with the right of occupying any other territories not previously possessed by civilized nations. The residence of the directors of this company was first fixed at Irkutsk, Siberia, which was the great depository or bonded warehouse for the Chinese trade with all the Russias, a short distance only from Kiachta, on the frontier, where the Mongols and Muscovites alone could meet for barter; it was, afterward, transferred to St. Petersburg, and these directors were personally made known to and placed under the surveillance of the Imperial Department of Commerce.

Those privileges, thus accorded by Paul, were confirmed and extended, even, by Alexander; and under these favorable auspices the power and influence of the Russian-American Company rapidly advanced. In 1803 its establishments extended from Attou to Sitka; during 1806 preparations were made to occupy the littoral regions north of the Columbia river, but that plan was soon abandoned.

AUTOCRATIC POWER OF THE RUSSIAN-AMERICAN COMPANY.—The government of Alaska by this company was arranged and directed in simple despotism; each trading post was superintended by a Russian overseer or "precashcheek", who, with the aid of a small number of Russians, maintained absolute control over all the natives in his district; he compelled them to labor incessantly, in and out of season, for the benefit of the company; these overseers were in turn under abject subserviency to a chief agent, one of which resided in the limits of four natural divisions of the country; those men were again directly responsible to the authority of the governor-general who resided at Sitka, and who was appointed really by the imperial government, though nominally by the directors; his powers were supposed to be limited and defined by regulations drawn up and signed by him in St. Petersburg; but, in fact, they were absolute, and irresponsible to any court on earth.

THE IRON-WILLED BARANOV.—The person who filled the office of governor-general soon after the organization of the Russian-American Company and for many years afterward, was Alexander Baranov; he was a man of iron will, of dauntless courage, shrewd and wholly devoid of tender feeling; under his autocratic management the affairs of this company prospered pecuniarily, and its stock rose accordingly in value; hence his proceedings were always approved at St. Petersburg, although the truth in regard to his cruelty was often made known there.

BAD REPUTATION OF PROMYSHELENIKS.—In addition to the natives themselves, the company transported to Alaska some four or five hundred Russians, who were termed "promyshleniks", or "hunters". They were employed as trappers, fishermen, seamen, soldiers or mechanics, just as their superiors might command, and they

* These quotations are in the Alaskan currency of that period, and refer to paper or parchment "rubles", each worth about 20 cents specie. See table of Russian weights, values, etc., in the Glossary.—H. W. E.

were under the same rule as that I have just described as applicable to the natives; their lot, according to Paul von Krusenstern, a Russian who voyaged thither in 1804-1805, seems to have been more uninviting even than that of the wretched natives.

BARANOV'S ATTEMPT TO COLONIZE CALIFORNIA.—Prior to 1812, Sitka was the extreme southern limit of the Russian-American Company. But old Baranov, greatly annoyed over the loss of supply ships from the Okotsk, by which their bread, at Kadiak and Sitka, was cut off for years at a time, determined to settle at some place south, where these necessities to a comfortable physical existence could be raised from the soil; so he asked of the Spanish governor at Monterey permission to erect a few houses on the shore of the small bay at Bodega, California, in order to "procure and salt the meat of the wild cattle" which overran that part of the country, north of the harbor of San Francisco, for the "use of the governor's table at New Archangel" (Sitka). The Castilian was happy to oblige a peer; but, in the lapse of three or four years after this permit was granted, the Russians had formed a large settlement, built a fort, and had, in actuality, taken possession of the country. The Spanish governor first remonstrated, then commanded Baranov to move off, in the name of his most Catholic majesty, the king of Spain. He discovered quickly, to his infinite chagrin, that the Russian had abused his confidence, and defied him. The Spaniard could not enforce his order, and Kuskov, the Russian deputy in charge at Bodega, openly taunted and resisted him. The Russian-American Company remained here practically unmolested, until 1842, when they sold their fixtures to General Sutter, a Swiss American, for \$30,000, and vacated California.

ATTEMPT TO SECURE THE SANDWICH ISLANDS.—In 1815 Baranov, instead of feeling chilled by the California unpleasantness, then in full headway, turned his ambitious eyes to the Sandwich islands, and actually despatched a vessel, or rather two of them, under the direction of Dr. Shaeffer, a German surgeon, who landed on Atooi, with one hundred picked Aleuts; but they were, at the lapse of a year, so discouraged by the open opposition of the Russian government to this scheme, that they abandoned the project.

RAPID DECAY OF THE RUSSIAN-AMERICAN COMPANY AFTER THE DEATH OF BARANOV.—In 1862, when the third extension of the twenty years' lease had expired, the affairs of the Russian-American Company were in a bad condition financially—deeply in debt, and the Imperial government was not disposed to renew the charter. This state of affairs gave rise, in 1864-'67, to negotiation with other trading organizations for the lease, which finally culminated in the purchase of Alaska by our government July, 1867. Such, in brief, was the Russian-American Company; it flourished under Baranov, but declined steadily to bankruptcy twenty years after his removal, when eighty years old, on account of extreme age, in 1818. In short, its great compeer, the Hudson Bay Company, was very much earlier initiated in the same manner June, 1670; then it finally organized with the Northwest Company under its present title, with renewed royal prerogatives and despotic sway over all British North America in 1821; it too has declined to a commercial cipher to-day, with its autocratic rights abolished long since; in 1857, I think; they were wholly rescinded; its subsidence was due, however, to the constant increasing white settlement of its territory.

33. METEOROLOGICAL ABSTRACT FOR THE MONTHS, FROM SEPTEMBER, 1872, TO APRIL, 1873, INCLUSIVE.

[Being interesting as the exhibit of an unusually severe winter. Made by Chas. P. Fish, United States Signal Service, St. Paul island.]

Character of observation.	Months of record.				Character of observation.	Months of record.			
	September.	October.	November.	December.		September.	October.	November.	December.
Mean of barometer, corrected.....	29.773	29.512	29.458	29.488	Mean relative humidity.....	85.0	83.0	86.6	87.8
Maximum of barometer, corrected.....	30.46	30.04	30.23	30.04	Maximum relative humidity.....	100	100	100	100.
Minimum of barometer, corrected.....	28.87	28.51	28.62	28.05	Minimum relative humidity.....	56	65	60	70
Monthly range of barometer, corrected.....	1.59	1.53	1.61	1.99	Prevailing wind.....	N.	N.	S.	N.
Greatest daily range of barometer, corrected.....	0.97	0.97	0.87	0.80	Number of miles traveled by wind.....	9,138	11,672	14,539	16,644
Least daily range of barometer, corrected.....	0.03	0.04	0.06	0.03	Mean daily velocity of wind.....	304.6	383	464.6	530.5
Mean daily range of barometer, corrected.....	0.259	0.293	0.339	0.249	Mean hourly velocity of wind.....	12.7	16	20.2	22.1
Mean of exposed thermometer.....	44°.2	36°.0	34°.3	26°.6	Maximum hourly velocity of wind.....	33	42	74	53
Maximum of exposed thermometer.....	52°	45°	41°	37°	Proportion of cloudiness.....	92	84	78.0	84
Minimum of exposed thermometer.....	33°	22°	23°	4°	Amount of rain-fall, in inches.....	2.69	3.08	2.38	2.99
Monthly range of exposed thermometer.....	19°	23°	18°	33°	Greatest daily amount of rain-fall.....	0.85	0.58	0.31	0.42
Greatest daily range of exposed thermometer.....	11°	11°	12°	11°	Amount of melted hail and snow (included in rain-fall).....	0.20	0.91	0.82	2.38
Least daily range of exposed thermometer.....	1°	1°	1°	1°	Number of days on which precipitation occurred.....	30	29	27	27
Mean of maxima of exposed thermometer.....	46°.8	38°.7	36°.2	29°.1	Number of days on which hail or snow fell.....	4	15	17	24
Mean of minima of exposed thermometer.....	41°.8	33°.3	31°.5	24°					
Mean daily range of exposed thermometer.....	5°.0	5°.4	4°.7	5°.1					

34. METEOROLOGICAL ABSTRACT, ETC.—Continued.

Character of observation.	Months of record.				Character of observation.	Months of record.			
	January.	February.	March.	April.		January.	February.	March.	April.
Mean of barometer, corrected	29.953	29.507	29.768	29.769	Mean relative humidity	85.7	86.2	81.8	84.29
Maximum of barometer, corrected	30.50	30.51	30.31	30.35	Maximum relative humidity	100	100	100	100
Minimum of barometer, corrected	29.32	28.26	29.05	29.00	Minimum relative humidity	53	49	46	63
Monthly range of barometer, corrected	1.18	2.25	1.26	1.35	Prevailing wind	E.N.E.	N.	N.	N.
Greatest daily range of barometer, corrected	0.58	0.95	0.60	0.73	Number of miles traveled by wind	17,903	16,646	14,512	18,607
Least daily range of barometer, corrected	0.03	0.06	0.05	0.03	Mean daily velocity of wind	577.5	504.3	468.1	620.3
Mean daily range of barometer, corrected	0.194	0.421	0.219	0.242	Mean hourly velocity of wind	24.1	24.8	19.5	25.84
Mean of exposed thermometer	152.7	189.6	129.6	232.9	Maximum hourly velocity of wind	43	62	88	53
Maximum of exposed thermometer	34°	34°	35°	33°	Proportion of cloudiness	62.8	74.9	68	73.6
Minimum of exposed thermometer	11°	12°	7°	3°	Amount of rain-fall, in inches	0.96	5.78	1.21	1.77
Monthly range of exposed thermometer	45°	46°	42°	32°	Greatest daily amount of rain-fall	0.39	1.67	0.38	0.50
Greatest daily range of exposed thermometer	22°	28°	20°	24°	Amount of melted hail and snow (included in rain-fall)	0.63	4.87	1.21	1.77
Least daily range of exposed thermometer	0°	3°	0°	3°	Number of days on which precipitation occurred	21	27	27	26
Mean of maxima of exposed thermometer	182.9	222.6	170.1	272.9	Number of days on which hail or snow fell	20	25	27	26
Mean of minima of exposed thermometer	112.9	152.1	70.4	192.4					
Mean daily range of exposed thermometer	70.0	70.5	90.7	82.5					

CLASSIFICATION OF THE WINDS.—The winds, here, may be classified under two heads: *Summer winds*—Blowing fresh during June, July, and August, principally from the west-northwest, varied with light airs from the northeast, and a gale or two from the southwest, lasting a day or so. *Winter winds*—Stirring fresh, to gales, throughout September to June, principally from the northwest to north-northeast; the “boorgas”, or snow and sleet storms, coming invariably from that direction. One or two heavy southeasters occur every fall, as a rule; in October generally; the brief lulls between blasts during this season are occupied by light southerly airs.

The summer winds are always charged with fog; while the winter gales usually blow out clear, unless accompanied with sleety spiculae or snow. In Siberia, Wrangell says that the southwest breezes are the coldest; the north-northwest ones are such here. The southerly airs are mild; but, I never felt any especial warmth when exposed to them.

CHARACTERISTICS OF BERING SEA ICE.—The descriptions which Wrangell, Demetri Laptev, and Hendenstrom have given of the behavior of the ice packs, between the Kolyma mouth and Cape Chelagskoi, were duplicated, in all their details, by the flocks which environed St. Paul during the winter of my residence there. On the 23d May, 1873, the ice fields around the island seemed as solid and unbroken to every point of the compass as they had for the five months preceding; and night settled over them in this shape; early in the morning of the following day, I arose, and, judge of my pleasant astonishment in viewing the open waters of Bering sea on every hand; the only suggestions left of its icy fetters were the numerous scattered cakes of thickest flocs, which bobbed about at wide intervals; there was little or no strong wind attending this sudden dissolution. The decomposition of the ice had taken place so secretly that its final relegation to its original form was fairly accomplished almost instantly and simultaneously, and without warning to human eyes; the alternate layering of salt, in ocean water ice, accounts for this peculiar vanishing of sea flocs.

THE FAILURE OF THE BAROMETER IN BERING SEA.—Pre-eminent among the many difficulties in the path of the mariner who may be cruising in Bering sea, is the fact that his barometer, which gives such timely and intelligent signals of warning, or of confidence, everywhere on the high seas of the earth, is, up here, by some reason or other, wholly impotent; and does nothing to aid, and everything to confuse and distress the sailor. Captain M. C. Erskine assured me of this; and his declaration is proof positive to my mind; he is undoubtedly, by the long experience of more than fourteen consecutive seasons' sailing in and out of Bering sea, 1867–1880 (this year's trip will make his fifteenth summer in those waters), the most thoroughly posted man, living, in regard to the currents, tides, winds and waves of the northwest coast between San Francisco and Bering straits.

With the exception of what Parry says in his narrative of his third voyage (1824), I do not find any specific mention made of this behavior of the barometer in the north; all of the arctic seamen, unquestionably, fully understand its utter worthlessness to them. Parry declares (Harper's *Family Library*, p. 66, vol. ii) “the indications of the barometer previous to and during this gale deserve to be noticed, because it is only about Cape Farewell that, in coming from the northward down Davis strait, this instrument begins to speak a language which has ever been intelligible to us as a weather-glass”.

During the course of my cruise in Bering sea, July–September, 1874, the barometer was carefully noted, and Captain Baker of the “Reliance” satisfied himself that the less attention he gave to it the better, as far as the success of our voyage was concerned.

34. THE METHOD OF DRESSING THE FUR-SEAL SKIN.

HOW SEAL-SKINS ARE DRESSED.—As a matter of interest to so large a proportion of our people who delight in the possession of, or covet, a seal-skin sacque, I have taken the liberty of republishing the following letter in a previous brochure; and, as it answers now equally well, in reply to the query as to how the natural seal-skin is tanned, plucked, and dyed so as to pass the ordeal of fashionable dress-parade, I herewith reproduce it, stating simply, in doing so, that the writer is a very successful operator, and one whose work, when finished from his hands, is said to be always equal, and often superior, to the best English manufacture. It was written to me in answer to my question, by the senior member of the firm undersigned:

ALBANY, October 22, 1874.

SIR: The Alaska Commercial Company sold in London, December, 1873, about 60,000 skins taken from the islands leased by our government, of the catch of 1873. The remainder of the catch, about 40,000, were sold in March. This company have made the collection of seal from these islands much more valuable than they were before their lease, by the care used by them in curing the skins and taking them only when in season. We have worked this class of seal for several years—when they were owned by the Russian American Fur Company, and during the first year they were owned by our government.

When the skins are received by us in the salt, we wash off the salt, placing them upon a beam somewhat like a tanner's beam, removing the fat from the flesh side with a beaming-knife, care being required that no cuts or uneven places are made in the pelt. The skins are next washed in water and placed upon the beam with the fur up, and the grease and water removed by the knife. The skins are then dried by moderate heat, being tacked out on frames to keep them smooth. After being fully dried, they are soaked in water and thoroughly cleansed with soap and water. In some cases they can be unhaired without this drying process, and cleansed before drying. After the cleansing process they pass to the picker, who dries the fur by stove-heat, the pelt being kept moist. When the fur is dry he places the skin on a beam, and while it is warm he removes the main coat of hair with a dull shoe-knife, grasping the hair with his thumb and knife, the thumb being protected by a rubber cob. The hair must be pulled out, not broken. After a portion is removed the skin must be again warmed at the stove, the pelt being kept moist. When the outer hairs have been mostly removed, he uses a beaming-knife to work out the finer hairs (which are shorter), and the remaining coarser hairs. It will be seen that great care must be used, as the skin is in that soft state that too much pressure of the knife would take the fur also; indeed, bare spots are made. Carelessly-cured skins are sometimes worthless on this account. The skins are next dried, afterward dampened on the pelt side, and shaved to a fine, even surface. They are then stretched, worked, and dried; afterward softened in a felling-mill, or by treading them with the bare feet in a hoghead, one head being removed and the cask placed nearly upright, into which the workman gets with a few skins and some fine, hardwood sawdust, to absorb the grease while he dances upon them to break them into leather. If the skins have been shaved thin, as required when finished, any defective spots or holes must now be mended, the skin smoothed and pasted with paper on the pelt side, or two pasted together to protect the pelt in dyeing. The usual process in the United States, is to leave the pelt sufficiently thick to protect them without pasting.

In dyeing, the liquid dye is put on with a brush, carefully covering the points of the standing fur. After lying folded, with the points touching each other, for some little time, the skins are hung up and dried. The dry dye is then removed, another coat applied, dried, and removed, and so on until the required shade is obtained. One or two of these coats of dye are put on much heavier and pressed down to the roots of the fur, making what is called the ground. From eight to twelve coats are required to produce a good color. The skins are then washed clean, the fur dried, the pelt moist. They are shaved down to the required thickness, dried, working them some while drying, then softened in a hoghead, and sometimes run in a revolving cylinder with fine sawdust to clean them. The English process does not have the washing after dyeing.

I should, perhaps, say that, with all the care used, many skins are greatly injured in the working. Quite a quantity of English dyed seal-skins were sold last season for \$17, damaged in the dye.

The above is a general process, but we are obliged to vary for different skins. Those from various parts of the world require different treatment; and there is quite a difference in the skins from the seal-islands of our country—I sometimes think about as much as in the human race.

Yours, with respect,

H. W. ELLIOTT, Esq.

GEO. C. TREADWELL & CO.

FUR-SEAL SKINS ARE OF PERMANENT VALUE.—I have frequently been asked whether, in the light of probable caprices of fashion, the value of fur-seal skins would at times shrink to a mere nominal figure, or not. I think the history of this trade during the last twenty years, at least, and since the skins have been treated for market as above recited, that this record shows the fur-seal skin to be an article of intrinsic value, just as objects of luxurious gold and silver work, of precious stones, are, and always will be, no matter what the style may decree. That the demand made by the "mode" will sensibly appreciate their fixed high value is also very certain, as it does so to-day; but, withdraw it, the seal-skin is still a costly purchase to the wearer, and will ever be so.

35. BERING, NOT BEHRING.

BERING, HIMSELF, WROTE HIS NAME, "BERING".—I, myself, do not understand the reason why a false sound should be given to this navigator's name, when our alphabet is fully equal to its correct rendition. Here is the way the Russians write it, and Bering himself signed his name *Беринг* = B e r i n g, (or B e r e n g), exactly in our own letter sounds. Yet this unwarranted corruption of the true equivalent of a celebrated name continues to be the common form of its expression by publication in England and this country. The Russians and the Danes sound the letter "r" in Bering precisely as we do; and the softened flattened sound of "r", indicated by *Behring*, is an error that should be avoided. It is originally a German corruption. Those Teutonic writers have made the Russian

nomenclature, as translated for us, by them, look strange and sound odd to hundreds of English minds who know better; but Forster, whom I quote below, was also a German, and hence his testimony to the correct orthography of the subject in question, is all the more valuable, especially so, since he says in the preface to his work there cited: "The numerous researches upon which, more especially in the ancient part, and that relative to the middle ages, I was obliged to enter, the multifarious departments of learning, from which I have derived some of the following notes and remarks, the orthography of a proper name, has frequently cost me hours, and sometimes whole days."

COGENT REASONS WHY IT IS "BERING".—Also in this relation, Professor Gill, of the Smithsonian Institution, informs me that "the name of the navigator, which has been conferred on the strait separating America and Asia, is unquestionably spelled *BERING* and not *BEHRING*. I submit in explanation my reasons: 1st. The navigator himself was born in Jutland, and a scion of a Danish family, whose members bore the name of Bering, and two representatives of which had the same Christian name, viz, (1) Vitus Bering, born 1617, died 1675, some time professor of poetry at Copenhagen, and (2) Vitus Bering, born 1682, died 1753, a priest of Ollerup and Kirkeby. The form *Behring*, so far as I can ascertain, is unknown in Denmark (see Nyerup's *Dansk-Norsk Litteratur-Lexicon*: v. i, pp. 56, 57, 1818). 2d. The form *Bering* is almost (but not quite) universally adopted in all non-English works, for example, *Biographie Universelle* (Michaud): v. 4, p. 261, 1811; also nouv. éd.: v. 4, p. 28, 1834; *Nouvelle Biographie Générale* (Hoefer): v. 5, p. 527, 1855; *Allgemeine Encyclopädie der Wissenschaften und Künste* (Ersch und Gruber): v. 9, p. 136, 1822; *Neues Konversations-Lexicon* (Meyer's): v. 3, p. 238, 1862; *Deutsch-Amerikanisches Conversations-Lexicon* (Schem): v. 2, p. 296, 1869, and numerous others. The exceptional cases are Pierer's *Universal Lexicon*, *Grand Dictionnaire Universel du xix^e siècle*, etc. In English dictionaries, the true form, *Bering*, is adopted in the *Brief Biographical Dictionary*, by Holes, 1865, and the *Dictionary of Biographical Reference*, by Phillips, 1871, and is gradually superseding the more familiar English form. An explanation of the reason of the origin of the name *Behring*, is found in the fact that it was originally derived from the Russian, without a knowledge of its primitive source, and was the supposed English phonetic expression of the Russian characters. Inasmuch, however, (1) as the original form of a name, without regard to its pronunciation, is universally adopted in our biographies and bibliographies, and (2) as the original form of the navigator's name was *Bering*, such is the correct one, and that which must ultimately supersede the other. It need only be added that Bering himself, and the Russians universally, (?) adopt that form when writing in English characters, and that the Russian letter ('u') in his name, represented by 'eh,' is especially ordained by the Russians to be rendered by the Latin character 'e,' in accordance with the pronunciation of the Latin and continental races generally."

In addition to this clear statement by Professor Gill, I desire to add the following: John Reinhold Forster, I. U. D., who sailed around the world with Captain Cook—a man that universally commanded respect in his day as a scholar and a high-minded gentleman—in his *Voyages and Discoveries in the North*, London, 1783, pp. 401–402, writes: "Nevertheless, it would be still more proper to make this strait a kind of monument to the very deserving and truly great navigator, *Veit Bering*, by naming it, after him, *Bering straits*."

THE COMMON ERROR OF "OFF" FOR "OV".—Furthermore, in this connection, it will be noticed that I do not spell the common Russian terminative "овъ" as "off"; these letters "овъ" in the Russian, are sounded by their makers exactly as we would "ov" in our own alphabet; for instance, take the name "*Baranov*," or "Барановъ" in the Russian; the common English and German spelling in our language is "*Baranoff*"; but, when these same writers come to "Барановичъ", instead of making it "*Baranofitch*", according to their first erroneous rule, they spell it correctly, "*Baranovitch*." In the same way they murder "*Pribylov*"; but did they chance to write it in the possessive, it would appear correctly as "*Pribylova*", and not "*Pribyloffa*". The Russians have our letter "f", as "ф" in their alphabet; and they use it freely when they want to express that same sound of "f" in our tongue; for instance, in "*Timothy*", they always say "*Timofay*" (Тимофей): "*Officer*," is "*Ofitsar*," etc.

THE UNWARRANTED "W" FOR "V".—This unsettled state of English orthography, as far as it relates to the introduction and correct rendition of Russian nomenclature, produces much embarrassment and annoyance to any writer who may seek for a fixed rule; not only do no two authors agree, but these authorities themselves are guilty of the inconsistencies which I have pointed out above. Thus, these German translations of the Russian have given us "*Moscow*", when there is no sound of "W" in the Russian language or suggestion of it in that facile and extensive alphabet of nearly forty letters. In the case of *Moscow*, I presume we must be guided by the authority and example of Gibbon, who declares that "some words, notoriously corrupt, are fixed, and as it were, naturalized in the vulgar tongue. The prophet *Mohammed* can no longer be stripped of the famous, though improper, appellation of *Mahomet*; the well-known cities of *Aleppo*, *Damascus*, and *Cairo*, would almost be lost in the strange descriptions of *Haleb*, *Damashk*, and *Al Cahira*."

HIGH TIME TO CORRECT SUCH BLUNDERS.—But, in all kindness, I submit that the name of Bering has not been so firmly travestied as has that of the Arabic chief, and ought not to be passed down misspelled on the map of the great sea and straits which perpetuate and commemorate his being. And it is high time such numberless outrages as "*Wolga*", for "*Volga*"; "*Kiew*", for "*Kiev*"; "*Azow*", for "*Azov*"; "*Pribiloff*", for "*Pribilov*"; "*Werst*", for "*Verst*", be corrected in all future printing of Russian nomenclature.

36. THE LAW PROTECTING THE SEAL-ISLANDS.

AN ACT to prevent the extermination of fur-bearing animals in Alaska.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful to kill any fur-seal upon the islands of St. Paul and St. George, or in the waters adjacent thereto, except during the months of June, July, September, and October, in each year; and it shall be unlawful to kill such seals at any time by the use of fire-arms, or use of other means tending to drive the seals away from said islands: *Provided*, That the natives of said islands shall have the privilege of killing such young seals as may be necessary for their own food and clothing during other months, and also such old seals as may be required for their own clothing and for the manufacture of boats for their own use, which killing shall be limited and controlled by such regulations as shall be prescribed by the Secretary of the Treasury.

SEC. 2. *And be it further enacted*, That it shall be unlawful to kill any female seal, or any seal less than one year old, at any season of the year, except as above provided; and it shall also be unlawful to kill any seal in the waters adjacent to said islands, or on the beaches, cliffs, or rocks where they haul up from the sea to remain; and any person who shall violate either of the provisions of this or the first section of this act, shall be punished on conviction thereof, for each offense, by a fine of not less than two hundred dollars nor more than one thousand dollars, or by imprisonment not exceeding six months, or by both such fine and imprisonment, at the discretion of the court having jurisdiction and taking cognizance of the offenses; and all vessels, their tackle, apparel, and furniture, whose crew shall be found engaged in the violation of any of the provisions of this act, shall be forfeited to the United States.

SEC. 3. *And be it further enacted*, That for the period of twenty years from and after the passage of this act, the number of fur-seals which may be killed for their skins upon the island of St. Paul is hereby limited and restricted to seventy-five thousand per annum; and the number of fur-seals which may be killed for their skins upon the island of St. George, is hereby limited and restricted to twenty-five thousand per annum: *Provided*, That the Secretary of the Treasury may restrict and limit the right of killing, if it shall become necessary for the preservation of such seals, with such proportionate reduction of the rents reserved to the government as shall be right and proper; and if any person shall knowingly violate either of the provisions of this section, he shall, upon due conviction thereof, be punished in the same way as is provided herein for a violation of the provisions of the first and second sections of this act.

SEC. 4. *And be it further enacted*, That immediately after the passage of this act, the Secretary of the Treasury shall lease, for the rental mentioned in section 6 of this act, to proper and responsible parties, to the best advantage of the United States, having due regard to the interests of the government, the native inhabitants, the parties heretofore engaged in the trade, and the protection of the seal-fisheries, for a term of twenty years from the 1st day of May, 1870, the right to engage in the business of taking fur-seals on the islands of St. Paul and St. George, and to send a vessel or vessels to said islands for the skins of such seals, giving to the lessee or lessees of said islands a lease duly executed, in duplicate, not transferable, and taking from the lessee or lessees of said islands a bond, with sufficient sureties, in a sum not less than \$500,000, conditioned for the faithful observance of all the laws and requirements of Congress, and of the regulations of the Secretary of the Treasury touching the subject-matter of taking fur-seals and disposing of the same, and for the payment of all taxes and dues accruing to the United States connected therewith. And in making said lease the Secretary of the Treasury shall have due regard to the preservation of the seal-fur trade of said islands, and the comfort, maintenance, and education of the natives thereof. The said lessees shall furnish to the several masters of vessels employed by them certified copies of the lease held by them, respectively, which shall be presented to the government revenue-officer for the time being, who may be in charge at the said islands, as the authority of the party for landing and taking skins.

SEC. 5. *And be it further enacted*, That at the expiration of said term of twenty years, or on surrender or forfeiture of any lease, other leases may be made in manner as aforesaid for other terms of twenty years; but no persons other than American citizens shall be permitted, by lease or otherwise, to occupy said islands, or either of them, for the purpose of taking the skins of fur-seals therefrom, nor shall any foreign vessel be engaged in taking such skins; and the Secretary of the Treasury shall vacate and declare any lease forfeited, if the same be held or operated for the use, benefit, or advantage, directly or indirectly, of any person or persons other than American citizens. Every lease shall contain a covenant on the part of the lessee that he will not keep, sell, furnish, give, or dispose of any distilled spirits or spirituous liquors on either of said islands to any of the natives thereof, such person not being a physician and furnishing the same for use as medicine; and any person who shall kill any fur-seal on either of said islands, or in the waters adjacent thereto (excepting natives as provided by this act), without authority of the lessees thereof, and any person who shall molest, disturb, or interfere with said lessees, or either of them, or their agents or employes, in the lawful prosecution of their business, under the provisions of this act, shall be deemed guilty of a misdemeanor, and shall for each offense, on conviction thereof, be punished in the same way and by like penalties as prescribed in the second section of this act; and all vessels, their tackle, apparel, appurtenances, and cargo, whose crews shall be found engaged in any violation of either of the provisions of this section, shall be

forfeited to the United States; and if any person or company, under any lease, herein authorized, shall knowingly kill, or permit to be killed, any number of seals exceeding the number for each island in this act prescribed, such person or company shall, in addition to the penalties and forfeitures aforesaid, also forfeit the whole number of the skins of seals killed in that year, or, in case the same have been disposed of, then said person or company shall forfeit the value of the same. And it shall be the duty of any revenue officer, officially acting as such on either of said islands, to seize and destroy any distilled spirits or spirituous liquors found thereon; *Provided*, That such officer shall make detailed report of his doings to the collector of the port.

SEC. 6. *And be it further enacted*, That the annual rental to be reserved by said lease, shall be not less than fifty thousand dollars per annum, to be secured by deposit of United States bonds to that amount, and in addition thereto a revenue tax or duty of two dollars is hereby laid upon each fur-seal skin taken and shipped from said islands during the continuance of such lease, to be paid into the Treasury of the United States; and the Secretary of the Treasury is hereby empowered and authorized to make all needful rules and regulations for the collection and payment of the same; and to secure the comfort, maintenance, education, and protection of the natives of said islands, and also for carrying into full effect all the provisions of this act; *Provided*, That the Secretary of the Treasury may terminate any lease given to any person, company, or corporation, on full and satisfactory proof of the violation of any of the provisions of this act, or rules and regulations established by him.

SEC. 7. *And be it further enacted*, That the provisions of the seventh and eighth sections of an act entitled "An act to extend the laws of the United States relating to customs, commerce, and navigation over the territory ceded to the United States by Russia, to establish a collection district therein, and for other purposes", approved July 27, 1868, shall be deemed to apply to this act; and all prosecution for offenses committed against the provisions of this act, and all other proceedings had because of the violations of the provisions of this act, and which are authorized by said act above mentioned, shall be in accordance with the provisions thereof, and all acts and parts of acts inconsistent with the provisions of this act are hereby repealed.

SEC. 8. *And be it further enacted*, That the Congress may at any time hereafter alter, amend, or repeal this act. Approved July 1, 1870.

AMENDED, MARCH 24, 1874.—*Be it enacted, etc.*, That the act entitled "An act to prevent the extermination of fur-bearing animals in Alaska", approved July first, eighteen hundred and seventy, is hereby amended so as to authorize the Secretary of the Treasury, and he is hereby authorized, to designate the months in which the fur-seals may be taken for their skins on the islands of St. Paul and St. George, in Alaska, and in the waters adjacent thereto, and the number to be taken on or about each island respectively.

37. THE ORGANIZATION AND REGULATIONS OF THE ALASKA COMMERCIAL COMPANY.

BY-LAWS OF THE ALASKA COMMERCIAL COMPANY, SAN FRANCISCO, CALIFORNIA.

I. The corporate name of this company is the Alaska Commercial Company, and its affairs are under the control of five trustees, who shall hereafter be chosen by the stockholders of the company on the second Wednesday of June in each year, and who shall hold office until their successors are elected. The annual meetings of the stockholders shall be held at the office of the company. At all elections of trustees by the stockholders, each stockholder shall be entitled to one vote for every share of stock held by him on the books of the company. Stockholders may vote by proxy. All proxies shall be signed by the party owning the stock represented.

II. The principal place of business of the company is San Francisco, California.

III. The regular meetings of the board of trustees will be held at the office of the company on the first Wednesday in each month, at 12 o'clock m., and no notice of such meeting to any of the trustees shall be requisite. Other meetings of the board of trustees may be held upon the call of the president, by notice, signed by him, of the time and place of meeting, personally served on each trustee residing within this state, or published in a newspaper of general circulation in San Francisco for ten days successively next preceding the day of such meeting. Special meetings may be held upon notice, signed by three trustees, stating the time and place of meeting, and the purpose for which the meeting is called, having been duly served on each trustee, or published in a newspaper of general circulation in San Francisco for ten days successively next preceding the day of meeting, and no business other than that specified in the notice shall be transacted at such special meeting. At all meetings of the board any three of the trustees being present shall constitute a quorum for the transaction of the business of the company. Adjourned meetings may be held in pursuance of a resolution of the board adopted at any regular or general meeting of the board. Any three trustees elected at any annual meeting of the stockholders of the company, and being present at the close of such stockholders' meeting may, on the same day, without notice to any of the trustees, meet and organize the board by the election of officers, and may transact such other business as may come before the board at such meeting.

IV. The officers of the company shall consist of a president, a vice-president, and a secretary, who shall be chosen by the board of trustees at their first meeting after the annual election of trustees; such officers to hold office one year, or until their successors are elected.

V. The president, or in his absence the vice-president, shall preside at the meetings of the board. In case neither is present, the board may appoint a president *pro tempore*.

VI. All vacancies in the board may be filled by the board at the next meeting after the existence of such vacancy, and it shall require the affirmative vote of three trustees to elect. In case of any vacancy occurring among the officers or agents of the company, the same may be filled at any meeting of the board.

VII. All certificates of the capital stock of the company shall be signed by the president and secretary, attested by the corporate seal of the company, and can be issued to the parties entitled thereto or their authorized agent. All transfers of stock shall be made on the books of the company by the secretary, upon surrender of the original certificate or certificates, properly indorsed by the party in whose favor the same was issued. No stock shall be transferred to any person not a stockholder of the company at the time of such transfer, unless the same shall have been offered for sale to the company, or stockholders of the company, and the purchase at the fair cash or market value refused, except by authority of a resolution of the board of trustees permitting such transfer.

VIII. The corporate seal of the company consists of a die of the following words: "Alaska Commercial Company, San Francisco, California."

IX. The corporate seal, and all property, securities, interests and business of the company, shall be under the control and general management of the president, subject to the direction of the board of trustees. The funds of the company shall be deposited (from time to time as they are received) to the credit of the company, with a bank doing business in San Francisco, to be designated by the president, and the said funds can be drawn from such bank only by proper checks or drafts, signed by the president or vice-president of the company. The books of the company shall be kept by the secretary, who shall also keep a correct record of all the proceedings of the board of trustees had at their meetings, and perform such other duties as the board of trustees may require.

X. The pay and salaries of all officers of the company shall be determined, from time to time, by the board of trustees.

XI. The president of the company shall have power to appoint and employ such general business agents, factors, attorneys, clerks, and other employes as he may deem proper and requisite for conducting the business and affairs of the company; and he shall fix the pay, commissions, or salaries of all such agents, factors, attorneys, clerks, and other employes, from time to time, as circumstances shall require.

XII. All transfers of the capital stock of this company, made to persons not citizens of the United States, or made for the use or benefit of any citizen or citizens of any foreign government, are absolutely void.

XIII. Dividends from the net profits of the company may be declared and paid by order of the board of trustees, in accordance with law.

XIV. These by-laws may be altered or amended by the board of trustees in the manner prescribed by law.

REGULATIONS FOR CONDUCT OF AFFAIRS ON THE SEAL-ISLANDS.

OFFICE ALASKA COMMERCIAL COMPANY,
SAN FRANCISCO, January, 1872.

The following regulations are prescribed for the guidance of all concerned:

1. The general management of the company's affairs on the islands of St. Paul and St. George is intrusted to one general agent, whose lawful orders and directions must be implicitly obeyed by all subordinate agents and employes.

*2. Seals can only be taken on the islands during the months of June, July, September, and October in each year, except those killed by the native inhabitants, for food and clothing, under regulations prescribed by the Secretary of the Treasury. Female seals and seals less than one year old will not be killed at any time, and the killing of seals in the waters surrounding the islands, or on or about the rookeries, beaches, cliffs, or rocks, where they haul up from the sea to remain, or by the use of fire-arms, or any other means tending to drive the seals away from the islands, is expressly forbidden.

3. The use of fire-arms on the islands, during the period from the first arrival of seals in the spring season until they disappear from the islands in autumn, is prohibited.

4. No dogs will be permitted on the islands.

5. No person will be permitted to kill seals for their skins on the islands, except under the supervision and authority of the agents of the company.

6. No vessels other than those employed by the company, or vessels of the United States, will be permitted to touch at the islands, or to land any persons or merchandise thereon, except in cases of shipwreck or vessels in distress.

*7. The number of seals which may be annually killed for their skins on St. Paul island is limited to 75,000, and the number which may be so killed on St. George island is limited to 25,000.

* Sections 2 and 7 of the above regulations were based upon the law of July 1, 1870; but since then Congress has given the Secretary of the Treasury the power to fix the ratio for each island upon a more intelligent understanding of the subject, and also to extend the time for taking seal-skins, from the 1st of June up to the 15th of August.—H. W. E.

8. No persons other than American citizens, or the Aleutian inhabitants of said islands, will be employed by the company on the islands in any capacity.

9. The Aleutian people living on the islands will be employed by the company in taking seals for their skins, and they will be paid for the labor of taking each skin and delivering the same at the salt-house forty cents, coin, until otherwise ordered by the Secretary of the Treasury. For other labor performed for the company, proper and remunerative wages will be paid, the amount to be agreed upon between the agents of the company and the persons employed. The working-parties will be under the immediate control of their own chiefs, and no compulsory means will ever be used to induce the people to labor. All shall be free to labor or not, as they may choose. The agents of the company will make selection of the seals to be killed, and are authorized to use all proper means to prevent the cutting of skins.

10. All provisions and merchandise required by the inhabitants for legitimate use will be furnished them from the company's stores, at prices not higher than ordinary retail prices at San Francisco, and in no case at prices above 25 per cent. advance on wholesale or invoice prices in San Francisco.

11. The necessary supplies of fuel, oil, and salmon will be furnished the people *gratis*.

12. All widows and orphan children on the islands will be supported by the company.

13. The landing or manufacture on the islands of spirituous or intoxicating liquors or wines will, under no circumstances, be permitted by the company, and the preparation and use of fermented liquors by the inhabitants must be discouraged in every legitimate manner.

14. Free transportation and subsistence on the company's vessels will be furnished all people who at any time desire to remove from the islands to any place in the Aleutian group of islands.

15. Free schools will be maintained by the company eight months in each year, four hours per day, Sundays and holidays excepted, and agents and teachers will endeavor to secure the attendance of all. The company will furnish the necessary books, stationery, and other appliances for the use of the schools, without cost to the people.

16. The physicians of the company are required to faithfully attend upon the sick, and both medical attendance and medicines shall be free to all persons on the islands; and the acceptance of gratuities from the people for such services is forbidden.

17. The dwelling-houses now being erected by the company will be occupied by the Aleutian families free of rent or other charges.

18. No interference on the part of the agents or employes of the company in the local government of the people on the islands, or in their social or domestic relations, or in their religious rites or ceremonies, will be countenanced or tolerated.

19. It is strictly enjoined upon all agents and employes of the company to at all times treat the inhabitants of the islands with the utmost kindness, and endeavor to preserve amicable relations with them. Force is never to be used against them, except in defense of life, or to prevent the wanton destruction of valuable property. The agents and employes of the company are expected to instruct the native people in household economy, and, by precept and example, illustrate to them the principles and benefits of a higher civilization.

20. Faithful and strict compliance with all the provisions and obligations contained in the act of Congress entitled "An act to prevent the extermination of fur-bearing animals in Alaska", approved July 1, 1870, and the obligations contained in the lease to the company executed in pursuance of said act, and the regulations of the Secretary of the Treasury, prescribed under authority of said act, is especially enjoined upon all agents and employes of the company. The authority of the special agents of the Treasury appointed to reside upon the islands must be respected, whenever lawfully exercised. The interest of the company in the management of the seal-fisheries being identical in character with that of the United States, there can be no conflict between the agents of the company and the agents of the government, if all concerned faithfully perform their several duties and comply with the laws and regulations.

21. The general agent of the company will cause to be kept books of record on each island, in which shall be recorded the names and ages of all the inhabitants of the islands, and, from time to time, all births, marriages, and deaths which may occur on the islands, stating, in cases of death, the causes of the same. A full transcript of these records will be annually forwarded to the home office at San Francisco.

22. Copies of these regulations will be kept constantly posted in conspicuous places on both islands, and any willful violation of the same by the agents or employes of the company will be followed by the summary removal of the offending party.

JOHN F. MILLER,

President Alaska Commercial Company.

General Miller, in January, 1881, was elected, by the legislature of California, to the Senate of the United States. He is succeeded as president of the Alaska Commercial Company by Mr. Lewis Gerstle, who is one of the original stockholders, and who has always been prominently identified with the business. The affairs of the company are now principally managed by Messrs. Gerstle, Sloss, Niebaum, and Neumann, on the Pacific coast; by Mr. Hutchinson, at Washington; and Sir Curtis Lampson in London.

38. COMMENTS UPON THE LEGISLATION OF CONGRESS.

RATIO OF CATCH AT FIRST INCORRECTLY APPORTIONED.—The original text of the existing law for the protection of the seal-islands, provides that the 100,000 seals which may be annually taken from them shall be proportioned by killing 75,000 on St. Paul and 25,000 on St. George. This ratio was based evidently upon the foregoing table of Veniaminov, which, if accurate, would clearly show that fully one-third as many seals repaired to the smaller island as to the larger one, and until I made my surveys, 1872-'74, it was so considered by all parties interested. The fact, however, which I soon discovered, is that St. George receives only one-eighteenth of the whole aggregate of fur-seal visitation peculiar to the Pribylov islands, St. Paul entertaining the other seventeen parts.

REASON FOR AMENDMENT OF 1874.—This amazing difference, in the light of prior knowledge and understanding, caused me, on returning to Washington in October, 1873, to lay the matter before the Treasury Department, and ask that the law be so modified that, in the event of abnormally warm killing-seasons, a smaller number might be taken from St. George, with a corresponding increase at St. Paul; for, unless this was done, it might become at any season a matter of great hardship to secure 25,000 killable seals on St. George, in the short period allotted by the law of July 1, 1870. The Treasury Department, while fully concurring in my representations, seemed to doubt its power to do so; then, with its sanction, I carried the question before Congress, January, 1874, and secured from that body an amendment of the act of July 1, 1870, above quoted in full (act, etc., approved March 24, 1874), which gives the Secretary of the Treasury full discretion in the matter, and fixes the hitherto inflexible ratio of killing on each island upon a sliding scale, as it were, for adjustment from season to season, upon a more intelligent understanding of the subject; and, also, this amendatory act grants an extension of the legal limit of killing, by giving the Secretary of the Treasury the power to fix it annually.

LAW WORKS WELL.—As the law is now amended, the killing on the two islands can be sensibly adjusted each season, by the relative number of seals on the two islands, which will vary so markedly on St. George according as it may be abnormally dry and warm when the period for driving the "holluschiekie" is at hand.*

SPECIAL AGENTS OF THE TREASURY DEPARTMENT.—Prior to March, 1872, the supervision of the Treasury Department over its interests on the Pribylov islands was directed by the detail of special agents from the Secretary, who paid them out of a contingent fund of \$50,000, which Congress voted in 1868 for the "collection of customs" in Alaska; this appropriation running out, the secretary drew the following bill, which Congress adopted, and it was approved March 5, 1872:

SECTION I. *Be it enacted, etc.,* That the Secretary of the Treasury be, and he is hereby, authorized to appoint one agent and three assistant agents, who shall be charged with the management of the seal-fisheries in Alaska, and the performance of such other duties as may be assigned to them by the Secretary of the Treasury; and the said agent shall receive the sum of ten dollars *per diem*; one assistant agent the sum of eight dollars *per diem*; and two assistant agents the sum of six dollars each *per diem* while so employed; and they shall also be allowed their necessary traveling expenses in going to and returning from Alaska, such expenses not to exceed the sum of three hundred dollars in any one year.

SEC. II. *And be it further enacted,* That the Secretary of the Treasury be, and is hereby, authorized to erect a dwelling-house upon each of the islands of St. Paul and St. George, for the use of said agents, the cost of both not to exceed the sum of six thousand dollars.

SEC. III. *And be it further enacted,* That the said agents be, and they are hereby, empowered to administer oaths in all cases relating to the service of the United States, and to take testimony in Alaska for the use of the government in any manner concerning the public revenues.

Under this law the present force of treasury officers is creditably maintained on the Pribylov islands. Living there, as they do, in perfect isolation, so far from headquarters, it is necessary that, to insure the personal ability of the officers to be out on the killing-grounds in the sealing-season, two agents at least should be detailed upon each island, as they are; should one fall sick, then the other is on hand. The work every year of taking the seals, like the moving of the tides, cannot and will not wait for any man; it is literally "now or never!" with its conduct.

* Upon my urgent and persistent representations, the law directing, and appropriating for, the maintenance of a revenue cutter in Alaska waters, for the protection of the seal-islands and sea-otter hunting-grounds, was inserted in the sundry civil budget for 1877; and, in May of that year, the late Capt. George W. Bailey, in the United States revenue marine cutter "Richard Rush", sailed on that errand from San Francisco. This special service has been continued ever since, and now will remain a regularly sustained action on the part of the department, I trust. The excellent record and efficiency of the supervision rendered by the revenue marine in Alaska has been so well maintained and is so apparent, that I do not see how it can be suffered to fall. It is the only effective arm of the United States government in that region, or that has ever been so. All travel in that country is essentially by water; nine-tenths of its people live by the seaside.

The fur-seals of Alaska, collectively and individually, are the property of the general government, and for their special and sole protection the extra legislation of July, 1870, was designedly enacted. Every fur-seal playing in the waters of Bering sea around about the Pribylov islands, no matter if found so doing one hundred miles away from those rookeries, belongs there, has been begotten and born thereon, and is the animal that the explicit shield of the law protects; no legal sophism or quibble can cloud the whole truth of my statement. Construe the law otherwise, then a marine license of hunting beyond a marine league (3 miles) from the shores of the Pribylov islands, would soon raise up such a multitudinous fleet, that its cruising could not fail, in a few short years, in so harassing and irritating the breeding-seals as to cause their withdrawal from the Alaskan rookeries, and probable retreat to those of Russia—a source of undoubted Muscovite delight and emolument, and of corresponding shame and loss to us.

The matter is, however, now thoroughly appreciated and understood at the Treasury Department, and has been during the past four years, as the seal pirates have discovered to their chagrin and discomfiture.

39. PARAGRAPHS OF REFERENCE RELATIVE TO SUBJECTS DISCUSSED IN THE PRECEDING MEMOIR, AND REFERRED TO AS **NOTE 39.**

A. PREVIOUS PUBLICATIONS OF THE WRITER [Section 1].—I allude, at the outset, to the fact that a brief digest of my surveys had been published by the government in 1873-'74; it is entitled *Condition of Affairs in Alaska*: 89, 1874. This report was principally given up to the state of the fur-trade over all Alaska, the people and resources thereof; it also contains the substance of a still briefer report of mine made upon the Pribylov islands in September, 1873, and was printed by the Treasury Department during my absence in Alaska. Owing to causes of which I have necessarily no personal knowledge, only 75 copies of this report were struck off; it was illustrated by 50 quarto plates photographed from my drawings and paintings.

B. ST. FELIX MUST NOT BE CONFOUNDED WITH MASAFUERA [Section 2].—The overshadowing number of fur-seals found on Masafuera and Juan Fernandez islands, just to the southward of this island, has caused a great deal of confusion as to the existence, or not, of *Arctocephalus* on this island and Ambrosia islet, in the old records and statements of Antarctic fur-sealers. It has, however, never been a very prominent rookery, but it has been one, nevertheless, and hence I give its name.

A fur-seal skin was taken from either the straits of Le Maire or Juan Fernandez as early as 1686, and presented to the Museum of the Royal Society in London; here it was first noticed as new by Dr. Grew, in 1694; but the name of the donor and the locality being unknown, the matter was allowed to drop by naturalists, and Grew's descriptions were laid aside by them as obscure and apocryphal; indeed, even as late as 1823, Baron Cuvier said of the Grew diagnosis, "*Que faire de cette phoque—Que faire de cette otarie?*" (*Dict. Class. d'Hist. Nat.*, tome xiii.)

I say that this specimen was taken from the above localities in all probability; because, unless it came from the Falkland islands, there were no other fur-seal grounds known to navigators at so early a date. Spanish and English buccaneers were, however, familiar with Juan Fernandez and Masafuera as soon as 1574-'86, or a full century prior to the receipt of the Grew specimen. These sea pirates, however, prided themselves over their swords alone; so we have no record of what they really knew or did. Nevertheless, some of them, evidently, employed a leisure hour or day in securing and transmitting the skin above referred to. In summing up, therefore, Henry Brewer, in 1646, at Staten land, first noticed the southern fur-seal. William Dampier, in 1683, first called specific attention to it as a fur-seal, and Dr. Grew, as above stated, first described it formally as a new seal to natural science. So much is due to the true literature of the Antarctic fur-seal.

C. PRIBYLOV'S DISCOVERY OF THE ISLANDS [Section 3].—"Anglieskie Boŭkta," or English bay, so-called by the natives because in 1849 a large English whale (?) ship was stranded on the shoals of that reach of the coast, and the wreck driven ashore there.

D. LAND AND SCENERY [Section 4].—This village lagoon has been filling up very perceptibly since 1868, when Hutchinson and Morgan then were able to sail in a small sloop, drawing six feet of water, up to its head. To-day such a vessel could not come nearer than half a mile to their anchorage of 1868. The principal shoaling takes place in a direct line here between Tolstoi Mees and the Village Hill, where a rocky reef seems to be slowly rising, pushed up by ice fields. The sloop yacht "Jabez Howe", which was wrecked in 1873 on Akootan, is probably the last sea-going vessel that has or ever will gain an entrance to the village lagoon, St. Paul island; or swing at anchor in the cove.

E. ST. PAUL [Section 4].—The physical difficulties of pedestrianism here recall vividly to my mind the recent death of Mr. Edward Gill, a brother of the distinguished naturalist, Professor Gill, of the Smithsonian Institution. Late in October, 1876, this young man, in company with several of the natives and two agents of the Alaska Commercial Company, started out one bright morning for a walk, intending to go to Northeast point, then to return by Nahsayvernia to English bay, and home to the village in the evening; they had journeyed on this route as far as Maroonitch, at the north shore, when a storm of wind and sleet arose which blew directly in their faces as they came across the island to English bay. Gill sank several times from exhaustion, caused by the severe exercise of walking in the sphagnum on Boga Slov and of jumping over the tussocks near the bay. Finally, at the head of the lagoon, and in sight of the village lights, he dropped into the long grass, utterly prostrated; his companions, too weak to carry him farther, struggled on, and when the relief party found him he was warm, but life had departed. He was in perfect health and condition at the starting; but the chill fury of the icy gale had compassed his death.

F. RESIDENT NATIVES OF ST. PAUL, JULY 1, 1870, TAKEN FROM PHILIP VOLKOV'S LISTS, AUGUST 8, 1873. [Section 5.]

[The names in italics were either dead or absent from the island at the date of copy, August 8, 1873.]

1. *Phillip Keemachneek.*
2. *Effrosenia, his wife.*
3. *Ivan, his son.*
4. *Danilo, his son.*
5. *Vassele Seedulee.*

6. *Marcena, his wife.*
7. *Alexander, his son.*
8. *Sylvester, his son.*
9. *Eseem Anoolanak.*
10. *Matroona, his wife.*

11. *Simeon, adopted son.*
12. *Marka Avelayah.*
13. *Feeleechat, his wife.*
14. *Peter Peeshenkov.*
15. *Matroona, his wife.*

16. Ivan Eemanov.
17. Anna, his wife.
18. Yeagor, his son.
19. Loobov, his step-daughter.
20. Maseem, his step-son.
21. Maria, his niece.
22. Nikolai Krukov.
23. Peter Krukov.
24. Agrafeena, his wife.
25. Ivan Korhootin.
26. Ooleena, his wife.
27. Yakhov Korhootin.
28. Lookahria, his sister.
29. Natalia Makoolena.
30. Maria Paranchina.
31. Kesar Shabbylean.
32. Agrafeena, his wife.
33. Neekon, his son.
34. *Ripimia Plotnikova.*
35. Avdotia, her daughter.
36. Prokoopee Meeseekin.
37. Eveduxsia, his wife.
38. Avdotia Meeseekina, his step-mother.
39. Anna, daughter of Meeseekin.
40. Deemestree Veatkin.
41. Evelampia Veatkin.
42. Balakshin (Benedict).
43. Matroona, his wife.
44. Meexhae, his son.
45. Balakshin, second (Benedict).
46. Stepan Krukov.
47. Natalie, his wife.
48. Avdokia Secirneekova (widow).
49. Timofay, her son.
50. Olga, her daughter.
51. Paraskevee, her daughter.
52. Akooleena, her daughter.
53. Michael Bayrhov.
54. Malania, his wife.
55. Agnes, his daughter.
56. Daniel, his nephew.
57. Avdotia, Schepeteenah (widow).
58. Tahreentee, her son.
59. Elsie, her son.
60. Hee-une-iah, her daughter.
61. Kerick Booterin, first chief.
62. Seeg-lee-teekiah, his wife.
63. *Patalamon, his son.*
64. Kerick, his son.
65. Salomayce, his daughter.
66. Ooleeta, his daughter.
67. George Booterin, his son.
68. Carp Booterin.
69. Lookariah Booterin.
70. Alexander Pancov.
71. Porfeerio, his son.
72. Avdotia, his step-daughter.
73. Paraskeevie, his step-daughter.
74. Yakhov Sootyabgin.
75. Eeroadea, his wife.
76. Feedosayee Saydeck.
77. Anesia, his wife.
78. Anna, his daughter.
79. Feoktista, his godmother.
80. Dayneeso Saydeck.
81. *Balz yahzeekov (Evelampia).*
82. Anna, his wife.
83. *Maria, his daughter.*
84. Maroon Nakock.
85. Paraskeevie, his wife.
86. Zachar, his step-son.
87. ———, his nephew.
88. Paraskeevie, niece.
89. Natalia Habarova.
90. Pavel Habarov, her son.
91. *Paul Shies-neckov (priest).*
92. *Mech-ah-elo, his son.*
93. Meeloveedova, Alexsandra (widow).
94. Simeon, her son.
95. *Alexsandra, her daughter.*
96. Antone, her son.
97. Marcia, her daughter.
98. Kerick Artamanov.
99. Olga, his wife.
100. Melania, his daughter.
101. Vasselesee, his daughter.
102. Kah-sayn-yah, his daughter.
103. Gearman Artamanov.
104. Anna Tarantayyah (widow).
105. Anna, her daughter.
106. Stephen Bayloglazov.
107. Yealeena, his wife.
108. *Saygee, his son.*
109. Anna, his daughter.
110. Paraskeevie, his adopted girl.
111. Ermolie Cushing.
112. Paokla, his wife.
113. Paokla, his daughter.
114. Oolyahnah, his daughter.
115. Aggie Cushing, his son.
116. Antone Sootyabgin.
117. Oolyahnah, his wife.
118. Meetrofan, his son.
119. *Mechaie, his son.*
120. Yakhov Mandrigan.
121. Afanashia, his wife.
122. *Lookaylean, his son.*
123. Maria, his daughter.
124. Oseep Pahomov.
125. Varvarah, his wife.
126. Maria Seedova (widow).
127. Abkakee, her son.
128. ———, her daughter.
129. ———, her daughter.
130. ———, her daughter.
131. ———, her daughter.
132. Alexsayee Neederazov.
133. Akooleena, his wife.
134. Christeena, his daughter.
135. Agrafeena, his daughter.
136. Keer Saydeck.
137. Yealeena, his wife.
138. *Maria, his daughter.*
139. Ivan Mandrigan.
140. Tatabyah, his wife.
141. Vasselee, his son.
142. Marfa, his daughter.
143. Feelat Teetov.
144. Peter, his son.
145. Yeon, his son.
146. Yeagor Arkashav.
147. Alexsandra, his wife.
148. Martin, his step-son.
149. Nikolaie, his step-son.
150. Stepan, his step-son.
151. Kerick, his son.
152. Arsaynee, his son.
153. Tatabyah, his daughter.
154. Timofay Evanov.
155. Fevronia, his daughter.
156. Paymen Kooznitzov.
157. Oseep Baizyahzeekov.
158. Alexsandra, his wife.
159. Paul, his son.
160. Kabsaynyah, his step-daughter.
161. Avdokia, his step-daughter.
162. *Kabsaynyah, his daughter.*
163. *Ivan Paranchin.*
164. Zaharroev Evemainov.
165. Keereenayah, his wife.
166. Fevronia, his daughter.
167. Ivan Hapov.
168. Anna, his sister-in-law.
169. *Alexsandra, his daughter.*
170. Ivan, his son.
171. Yeagor Korhootin.
172. Zachar Saydeck.
173. Oosteenia, his wife.
174. Vasselee, his son.
175. Marva, his daughter.
176. *Nekon, his nephew.*
177. Feelp Saydeck.
178. Stepan Skahvortsov.
179. Philip Volkov.
180. Ellen, his daughter.
181. Matroona, his daughter.
182. Markiel Volkov, his son.
183. Gavrelo Korchurgin.
184. Lukaylean, his son.
185. *Ivan Sootyabgin.*
186. Hecyoniah, his wife.
187. Anesia, his daughter.
188. *Emelian Sootyabgin.*
189. Marko Korhootin.
190. Dareyah, his wife.
191. Ivan, his son.
192. Zeenovia, his daughter.
193. Timofay Glottov.
194. Maria, his wife.
195. ———, his son.
196. Ivan, his son.
197. Yeafeemia, his daughter.
198. Iraklin Mandrigan.
199. Oosteenie, his wife.
200. Eeon, his son.
201. Paul Soovorrov.
202. Vassa, his wife.
203. ———, *his son.*
204. Akyleena, his mother.
205. *Agrafeena, his adopted girl.*
206. Yeafeem Korhootin.
207. Palahgayee, his wife.
208. *Peter, his son.*
209. Luka Mandrigan.
210. Eereena, his wife.
211. Neeketa Yitchmainov.
212. Christeena, his daughter.
213. Domenah, his daughter.
214. Tabeesah, his daughter.
215. Ivan Yitchmainov.
216. Michael Korzerov.
217. Alexsandra, his wife.
218. Stepan Korzerov.
219. Paul Korzerov.
220. *Ivan Korzerov.*
221. Palahgayah, his mother.
222. Feodar, her son.
223. *Eveduxsia, her daughter.*
224. Platone Tarakanov.
225. Marfa, his wife.

226. *Akoolena*, his mother.
 227. Kerick Tarakanov.
 228. Domian M. Kok (John Frater).
 229. Oolyahnah, his wife.
 230. Anna, his daughter.
 231. Salomayah, Artamanov's daughter.

White men in charge.

1. Dr. McIntyre.
 2. H. W. McIntyre.
 3. Dr. Cramer.
 4. *John M. Morton.*

5. Chas. Bryant.
 6. D. Webster.
 7. ———, a cooper.
 8. ———, a carpenter.

WHAT CONSTITUTES A NATIVE OF ST. PAUL.—There has been some petty divergence of opinion on the island as to who are the real "natives" thereof, because these natives enjoy certain privileges that are very valuable to them and coveted by all outside Alaskan brethren.

In this connection the people living here are divided into three classes; that is, the males:

First. The natives, properly speaking, or those who have been born and raised upon the Pribylov islands; not over one-quarter of the present adult population can lay claim to this title.

Second. The people who were living thereon, but not born natives at the time of the transfer of all Alaska, July, 1867; this class constitutes a majority of the citizens of the two islands as they exist to-day.

Third. The people who were living and working as sealers on the Pribylov islands at the date of the granting by the government of the present lease to the Alaska Commercial Company, August 31, 1870.

Of the above three divisions, strict justice and true equity unite in recognizing the third class as the natives of the Pribylov islands. This settles the question also to the best satisfaction of these people themselves, and removes every quibble of dispute in the premises. Accurate records of the men, women, and children living on each island at the date of the lease in 1871 can be found in the church registers on both St. Paul and St. George.

CURIOUS DERIVATION OF NATIVES' NAMES.—Any one at all acquainted with the Russian language will not fail to notice that the names in the above list have some odd derivations, relating to physical peculiarities, defects, and other originations that are more or less comical in their suggestions. I was told by a very bright Russian, who spent a season here, 1871-72, as special agent of the Treasury Department, that the Aleutian ancestors of these people when they were converted and baptized into the Greek Catholic church received their names, *bram new*, from the fertile brains of the priests, who, after exhausting the common run of Muscovitic titles, such as our Smiths and Joneses, were compelled to fall back upon some personal characteristics of the new claimant for civilized nomenclature. Thus we have to-day on the seal-islands a "Stepan Bayloglazov", or "Son of a White Eye", "Oseep Baizyahzeekov", or "Son of a Man without a Tongue". A number of the old Russian governors and admirals of the imperial navy are represented here by their family names, though I do not think, from my full acquaintance with the name-sakes, that the distinguished owners in the first place had anything to do with their physical embodiment on the Pribylov islands.

CAUSES OF DEATH AMONG THE PEOPLE.—The principal cause of death among the people, by natural infirmity, on the seal-islands, is the varying forms of consumption and bronchitis, always greatly aggravated by that inherited scrofulous taint or stain of blood which was, in one way or another, flowing through the veins of their recent progenitors, both here and throughout the Aleutian islands. There is nothing worth noticing in the line of nervous diseases, unless it be now and then the record of a case of alcoholism superinduced by excessive quass drinking. This "makoolah" intemperance among these people, which was not suppressed until 1876, was a chief factor to the immediate death of infants; for, when they were at the breast, the mothers would drink quass to intoxication, and the stomachs of the newly-born Aleuts or Creoles could not stand the infliction which they received, even second-hand. Had it not been for this wretched spectacle, so often presented to my eyes in 1872-73, I should hardly have taken the active steps which I did to put the nuisance down; for it involved me, at first, in a bitter personal controversy, which, although I knew at the outset it was inevitable, still weighed nothing in the scales against the evil itself.*

A few febrile disorders are occurring, yet they yield readily to good treatment. The chief source of sickness used to arise from the wretched character of the barrabkies in which they lived; but it was, at first, a very difficult matter to get frame houses to supplant successfully the sod-walled and dirt-roofed huts of the islands.

DIFFICULTY OF GETTING SUITABLE HOUSES.—Many experiments, however, were made, and a dozen houses built, ere the result was as good as the style of primitive housing, when it had been well done and kept in best

*This evil of habitual and gross intoxication, under Russian rule, was not characteristic of these islands alone, it was universal throughout Alaska. Sir George Simpson, speaking of the subject, when in Sitka, April, 1842, says: "Some reformation certainly was wanted in this respect; for of all the drunken, as well as of all the dirty places that I had visited, New Archangel [Sitka] was the worst. On the holidays in particular, of which, Sundays included, there are one hundred and sixty-five in the year, men, women, and even children were to be seen staggering about in all directions." [Simpson: *Journey Around the World*; 1841-42, p. 88.]

Surprise has often been genuine among those who inquire, over the fact that there is no law officer here at either village, and wonder is expressed why such provision is not made by the government. But, when the following facts relative to this subject are understood, it is at once clear that a justice of the peace and his constabulary, would be entirely useless, if established on the seal-islands. As these natives live here, they live as a single family in each settlement, having one common purpose in life and only one; what one native does, eats, wears, or says, is known at once to all the others, just as whatsoever any member of our household may do will soon be known to us all who belong to its organization; hence if they steal or quarrel among themselves, they keep the matter wholly to themselves, and settle it to their own satisfaction. Were there rival villages on the islands and diverse people and employment, then the case would be reversed, and need of legal machinery apparent.

possible repair. In such a damp climate, naturally, a strong moldy smell pervades all inclosed rooms which are not thoroughly heated and daily dried by fires; and, in the spring and fall frost works through and drips and trickles like rain down the walls. The present frame houses occupied by the natives owe their dryness, their warmth and protection from the piercing "boorgas", to the liberal use of stout tarred paper in the lining. The overpowering mustiness of the hallways, outhouses, and, in fact, every roofed-in spot, where a stove is not regularly used, even in the best-built residences, is one of the first disagreeable sensations which the new arrivals always experience when they take up their quarters here. Perhaps, if it were not for the nasal misery that floats in from the killing-grounds to the novice, this musty, moldy state of things up here would be far more acute, as an annoyance, than it is now. The greater grief seems to soon fully absorb the lesser one; at least in my own case, I can affirm the result.

AMIALE CHARACTER OF THE NATIVES.—These people are singularly affectionate and indulgent toward their children. There are no "bald-headed tyrants" in our homes, as arbitrary and ruthless in their rule as are those snuffly babies and young children, on the seal-islands. While it is very young, the Aleut gives up everything to the caprice of his child, and never crosses its path or thwarts its desire; the "deetiah" literally take charge of the house; but as soon as these callow members of the family become strong enough to bear burdens and to labor, generally between 12 and 15 years of age, they are then pressed into hard service relentlessly by their hitherto indulgent parents; the extremes literally meet in this application.

They have another peculiarity: when they are ill, slightly or seriously, no matter which, they maintain or affect a stolid resignation, and are patient to positive apathy. This is not due to deficiency of nervous organization, because those among them who exhibit examples of intense liveliness and nervous activity, behave just as stolidly when ill as their more lymphatic townsmen do. Boys and girls, men and women, all alike are patient and resigned when ailing and under treatment; but it is a bad feature after all, inasmuch as it is well-nigh impossible to rally a very sick man who himself has no hope, and who seems to mutely deprecate every effort to save his life.

DISPOSITION TO GAMBLE.—The inherent propensity of man to gamble is developed here to a very appreciable degree, but it in no way whatever suggests the strange gaming love and infatuation with which the Indians and Eskimo elsewhere of Alaska are possessed. The chief delight of the men and boys of the two villages is to stand on the street corners "pitching" half-dollars; so devoted, indeed, have I found the native mind to this hap-hazard sport, that frequently I would detect groups of them standing out in pelting gales of wind and of rain, "shying" the silver coin at the little dirt-driven pegs. A few of them, men and women, play cards with much skill and intelligence.

CHILDREN'S SPORTS.—The urchins play marbles, spin tops, and fly kites, intermittently, with all the feverish energy displayed by the youth of our own surroundings; they frolic at base-ball, and use "shinny" sticks with much volubility and activity. The girls are, however, much more repressed, and, though they have a few games, and play quietly with quaintly dressed dolls, yet they do not appear to be possessed of that usual feminine animation so conspicuously marked in our home life.

ATTACHMENT TO THE ISLANDS.—The attachment which the natives have for their respective islands was well shown to me in 1874. Then, a number of St. George people were taken over to St. Paul, temporarily, to do the killing incidental to a reduction of the quota of 25,000 for their island and a corresponding increase at St. Paul; they became homesick immediately, and were never tired of informing the St. Paul natives that St. George was a far handsomer and more enjoyable island to live upon! that walking over the long sand reaches of "Pavel" made their legs grievously weary, and that the whole effect of this change of residence was "oehen scootchnie". Naturally, the ire of the St. Paul people rose at once, and they retorted in kind, indicating the rocky surface of St. George, and its great inferiority as a seal-island. I was surprised at the genuine feeling on both sides, because, as far as I could judge from a residence on each island, it was a clear case of tweedle-dee and tweedle-dum between them, as to opportunities and climate necessary for a pleasurable existence. The natives, themselves, are of one and common stock, though the number of Creoles on St. George is relatively much larger than on St. Paul; consequently the tone of the St. George village is rather more sprightly and vivacious.

CREATURE COMFORTS.—As far as a purely physical existence goes, the American method of living on and in the climate of the Pribylov islands is highly conducive to strength and health. Tea and coffee, seasoned with condensed milk and lump sugar; hot biscuits, cakes, and waffles; potatoes, served in every method of cookery; salt salmon, cod-fish, and corned beef; mess pork; and, once a week, a fresh roast of beef or steaks; all the canned vegetables and fruits; all the potted sauces, jams, and jellies; pies, puddings, and pastries; and the exhaustive list of purely sea-faring dishes, such as pea and bean, barley and rice soups, curries, and maccaroni; these constitute the staples and many of the luxuries with which the agents of the Alaska Commercial Company prolong their existence while living here in the discharge of their duties, and to which they welcome their guests for discussion and glad digestion.

A piano on St. Paul in the company house, an assorted library, embracing over 1,000 volumes, selected from standard authors in fiction, science, and history, together with many other unexpected adjuncts of high comfort for body and soul, will be found on these islands, wholly unexpected to those who first set foot upon them. A small Russian printed library has also been given by the company to the natives on each island for their special entertainment. The rising generation of sealers here, if they read at all, will read our own typography.

G. FOOD AND STORE SHOPPING OF THE NATIVES [Section 5].—Most of these articles of food mentioned heretofore are purchased by the natives in the company's store at either island; this food and the wearing apparel, crockery, etc., which the company bring up here for the use of the people, is sold to them at the exact cost price of the same, plus the expenses of transportation; and, many times within my knowledge, they have bought goods here, at these stores, at less rates than they would have been subjected to in San Francisco; the object of the company is not, under any circumstances, to make a single cent of profit out of the sale of these goods to the natives; they aim only to clear the cost and no more. Instructions to this effect are given to its agents, while those of the government are called upon to take notice of the fact.

The store at St. Paul, as well as that at St. George, has its regular annual "opening" after the arrival of the steamer in the spring, to which the natives seem to pay absorbed attention; they crowd the buildings day and night, eagerly looking for all the novelties in food and apparel; these slouchy men and shawl-hooded women, who pack the area before the counters here, seem to feel as deep an interest in the process of shopping as the most enthusiastic votaries of that business do in our own streets; it certainly seems to give them the greatest satisfaction of their lives on the Pribylov islands.

H. VIGILANCE OF THE NATIVES [Section 7].—One of the peculiarities of these people is that they seldom undress when they go to bed—neither the men, women, nor children; and also that at any and all hours of the night during the summer season, when I have passed in and out of the village to and from the rookeries, I always found several of the natives squatting before their house doors or leaning against the walls, stupidly staring out into the misty darkness of the fog, or chatting one with the other over their pipes. A number of the inhabitants, by this disposition, are always up and around throughout the settlement during the entire night and day. In olden times, and even recently, these involuntary sentinels of the night have often startled the whole village by shouting at the top of their voices the pleasant and electric announcement of the "ship's light!" or have frozen it with superstitious horror in the recital, at daybreak, of ghostly visions.

I. HABITS OF FUR-SEAL PUPS [Section 9].—I have repeatedly watched young pups as they made advances to nurse from another pup's mother; the result invariably being, that while the mother would permit her own offspring to suckle freely, yet, when these little strangers touched her nipples, she would either move abruptly away, or else turn quickly down upon her stomach, so that the maternal fountains were inaccessible to the alien and hungry "kotickie". I have witnessed so many examples of the females turning pups away, to suckle only some particular other one, that I feel sure I am entirely right in saying that the seal-mothers know their own young; and that they will not permit any others to nurse save their own. I believe that this recognition of them is due chiefly to the mother's scent and hearing.

J. PARASITES OF THE FUR-SEAL [Section 9].—The fur-seal spends a great deal of time, both at sea and on land, in scratching its hide; for it is annoyed by a species of louse, a *pediculus*, to just about the same degree and in the same manner that our dogs are by fleas. To scratch, it sits upon its haunches, and scrapes away with the toenails of first one and then the other of its hind-flippers; by which action it reaches readily all portions of its head, neck, chest, and shoulders; and, with either one or the other of its fore-flippers, it rubs down its spinal region back of the shoulders to the tail. By that division of labor with its feet, it can promptly reduce, with every sign of comfort, any lousy irritation wheresoever on its body. This *pediculus* peculiar to the fur-seal attaches itself almost exclusively to the pectoral regions; a few, also, are generally found at the bases of the auricular pavilions.

When the fur-seal is engaged in this exercise, it cocks its head and wears exactly the same expression that our common house-dog does while subjugating and eradicating fleas; the eyes are partly or wholly closed; the tongue lolls out; and the whole demeanor is one of quiet but intense satisfaction.

The fur-seal appears also to scratch itself in the water with the same facility and unction so marked on land; only it varies the action by using its fore-hands principally, in its fluvatile exercise, while its hind-feet do most of the terrestrial scraping.

K. HEALTHINESS OF THE FUR-SEALS [Section 9].—While I have written with much emphasis upon the total absence of any record as to the prevalence of an epidemic in these large rookeries, I should, perhaps, mark the fact that no symptoms of internal diseases have ever been noticed here, such as tuberculosis of the lungs, etc., which invariably attack and destroy the fur-seal when it is taken into confinement, as well as the sea-lions also; the latter, however, have a much greater power of endurance under such artificial circumstances of life. The thousands upon thousands of disemboweled Pribylov fur-seal carcasses have never presented abnormal or diseased viscera of any kind.

L. BEHAVIOR OF FUR-SEALS AT NIGHT [Section 9].—I naturally enough, when beginning my investigation of these seal-rookeries, expected to find the animals subdued at night, or early morning, on the breeding-grounds; but a few consecutive nocturnal watches satisfied me that the family organization and noise was as active at one time as at another throughout the whole twenty-four hours. If, however, the day preeding had chanced to be abnormally warm, I never failed then to find the rookeries much more noisy and active during the night than they were by daylight. The seals, as a rule, come and go to and from the sea, fight, roar, and vocalize as much during midnight moments as they do at noonday times. An aged native endeavored to satisfy me that the "seeatchie" could

see much better by twilight and night than by daylight. I am not prepared to prove to the contrary, but I think that the fact of his not being able to see so well himself at that hour of darkness was the true cause of most of his belief in the improved nocturnal vision of the seals.

As I write, this old Aleut, Phillip Volkov, has passed to his final rest—"un konchielsah" winter of 1878-'79. He was one of the real characters of St. Paul; he was esteemed by the whites on account of his relative intelligence, and beloved by the natives, who called him their "wise man", and who exulted in his piety. Phillip, like the other people there of his kind, was not much comfort to me when I asked questions as to the seals. He usually answered important inquiries by crossing himself, and replying, "God knows." There was no appeal from this.

M. SULLENNESS OF OLD MALE SEALS [Section 10].—The old males, when grouped together by themselves, at the close of the breeding-season, indulge in no humor or frolicsome festivities whatsoever. On the contrary, they treat each other with surly indifference. The mature females, however, do not appear to lose their good nature to anything like so marked a degree as do their lords and masters, for they will at all seasons of their presence on the islands be observed, now and then, to suddenly unbend from severe matronly gravity by coyly and amiably tickling and gently teasing one another, as they rest in the harems, or later, when strolling in September. There is no sign given, however, by these seal-mothers of desire or action in fondling or caressing their pups; nor do the young appear to sport with any others than the pups themselves, when together. Sometimes a yearling and a five or six months-old pup will have a long-continued game between themselves. They are decidedly clannish in this respect—creatures of caste, like Hindoos.

N. LEAPING OUT OF WATER: "DOLPHIN JUMPS" [Section 10].—As I never detected the sea-lions or the hair-seals leaping from the water around these islands, in those peculiar dolphin-like jumps which I have hitherto described, I made a note of it early during my first season of observation, for corroboration in the next. It is so: neither the sea-lion nor the hair-seal here ever leaped from the ocean in this agile and singular fashion heretofore described. Allen, so conservative usually, seems, however, to have fallen into an error by reading the notes of Mr. J. H. Blake, descriptive of the sea-lions of the Gallapagos islands. As Allen quotes them entire in a foot-note (page 211, *History of North American Pinnipeds*), I am warranted in calling attention to the fact, that no authentic record has as yet been made of such peculiar swimming by *Phocidæ*, or the sea-lion branch of the *Otariidæ*. My notice has been called to this mistake by Professor Allen's own note, page 367, upon a quotation from my work, citing Mr. Blake's notes above referred to, which are themselves very interesting, but do not even hint at a dolphin-jump.

How fast the fur-seal can swim, when doing its best, I am naturally unable to state. I do know that a squad of young "hollaschiekie" followed the "Reliance", in which I was sailing, down from the latitude of the seal-islands to Akootan pass with perfect ease; playing around the vessel, while she was logging straight ahead, 14 knots to the hour.

The fur-seal, the sea-lion, the walrus, and the hair-seal all swim around these islands, and in these waters, submerged, extended horizontally and squarely upon their stomachs. I make this note here because I am surprised to read [on page 651, Allen: *Hist. N. A. Pinnipeds*] that the harp (hair) seal's "favorite position when swimming, as affirmed by numerous observers, is on the back or side, in which position they also sleep in the water". Although this is a far distant, geographically speaking, relative of the hair-seal of St. Paul island, yet the remarkable difference in fashion of swimming seems hardly warranted, when the two animals are built exactly alike. Still, I have no disposition to question, earnestly, the truth of the statement, inasmuch as I have learned of so many very striking radical differences in habits of animals as closely related, as to pause, ere seriously doubting this assertion that a harp-seal's favorite way in swimming is to lie upon its back when so doing. It is simply an odd contradiction to the method employed by the hair-seals of the North Pacific and of Bering sea.

While I am unable to prove that the fur-seal possesses the power to swim to a very great depth, by actual tests instituted, yet I am free to say that it certainly can dive to the uttermost depths, where its food-fish are known to live in the ocean; it surely gives full and ample evidence of possessing the muscular power for that enterprise. In this connection, it is interesting to cite the testimony of Mr. F. Borthen, the proprietor of the Fro islands, a group of small islets off Trondhjems fjord, in Norway; this gentleman has had an opportunity of watching the gray-seal (*Halichærus grypus*) as it bred and rested on these rocks during an extended period of time. Among many interesting notes as to the biology of this large hair-seal, he says, "As a proof that they (the seals) fetch their food from a considerable depth, it is related that a few years ago a young one was found caught by one of the hooks of a fishing line that was placed at a depth of between 70 and 80 fathoms, on the outer side of the islands. Gray-seals have several times been seen to come up to the surface with lings (*Molva vulgaris*) and other deep-water fishes in their mouths, such fishes seldom or never found at a less depth than between 60 and 70 fathoms."—[Robert Collett on the Gray Seal, *Proc. Zool. Soc.*, London: Part ii, 1881, p. 337.]

Q. MONSTROSITIES AMONG THE SEALS.—Touching this question of monstrosities, I was led to examine a number of alleged examples presented to my attention by the natives, who took some interest, in their sluggish way, as to what I was doing here. They brought me an albino fur-seal pup, nothing else, and gravely assured me that they knew it owed its existence to the fecundation of a sea-lion cow by a fur-seal bull; "if not so, how could it get that color?" I was also confronted with a specimen—a full and finely grown four-year-old *Callorhinus* which had,

at some earlier day, lost its testicles either by fighting or accident while at sea; perhaps shaven off by the fangs of a saw toothed shark, and also gravely asked to subscribe to the presence of a hermaphrodite!

Undoubtedly some abnormal birth-shapes must make their appearance occasionally; but, at no time while I was there, searching keenly for any such manifestation of malformation on the rookeries, did I see a single example. The morphological symmetry of the fur-seal is one of the most salient of its characteristics, viewed as it rallies here in such vast numbers; but the osteological differentiation and asymmetry of this animal is equally surprising.

P. THE DERIVATION OF THE NOMENCLATURE OF THE ROOKERIES. *The Reef rookery*.—"The Reef", so-called on account of that dangerous line of submerged rocks, scarcely awash, which makes out to the southward from the point. The very first seals of the season usually land here every spring.

Zoltoi hauling-grounds.—From "Zolotoi", or "golden", a Russian title given to the beach on account, perhaps, of its beauty, contrasted with the rough, rocky coasts elsewhere on the island. There is no trace of precious mineral in its composition, however, or even the glint of iron pyrites.

Gorbotch rookery.—"Gorbotch", or "humpback"; this name doubtless given it from the broken-backed outline to the west shore of the reef peninsula, on which the rookery is located.

Nah Speel rookery.—"Nah Speel", corrupted from "speetsah", or point, why so distorted I have not satisfactorily learned from the people. It arises from some localism, undoubtedly, pertinent long ago, but since forgotten.

Lukannon rookery.—"Lukannon"; so named after one of the Russian pioneers, a sailor, who is said to have taken from St. Paul island in 1787, over 5,000 sea-otters, aided by another promyshlenik, named Kaiekov; in the following year they only secured 1,000; and since then none have ever been taken from there to notice; while during the last forty years not one, even, has been seen.

Keetavie rookery.—"Keetavie", from "Keet", or Whale. When the whaling fleets were active in these waters, 1849-'56, a very large right whale, killed by some ship's crew, drifted ashore at the point here, and has thus given this name to it.

Tolstoi rookery.—"Tolstoi", or "thick". This is an indefinite name which the Russians use all over their geography of Alaska, just as we employ "Deer Creek" or "Muddy Fork" in our topographical nomenclature of the West. This point at St. Paul is, however, a thick and solid one; more so than any other headland there.

Zapadnie rookery.—"Zapadnie", or "westward"; one of the few bear stories, which the natives told me, in response to my queries as to the presence of polar "medvaidskie" in early times, is located between Boga Slov and Zapadnie point; there are one or two rude basaltic caves on the slopes of this hill, into which the natives can squeeze themselves by great effort; here, they have declared to me, that as recently as 1848, a large polar bear lived and infested the island for some time. It was finally shot by a *posse comitatus* of the people, who were assisted by an English whale-boat's crew that, noticing the skurry on land, came ashore and joined in the hunt, armed with their lances. No record is made of bruin on the Pribylov since the death of this one. It undoubtedly was astray from St. Matthew island, two hundred miles to the northward. Prior to this event, the natives count several bear fights and routs—at wide intervals, however—since the occupation of the islands.

Polavina rookery.—"Polavina", or "half way"; so named because the point and the old deserted village site contiguous was nearly half-way between Novostoshnah and the village. An officer of the government, C. P. Fish, United States Signal Service, in 1874, started out to measure anew the height of Polavina Sopka; he strapped a barometer to his shoulders, and left the village early one July morning. The fog thickened up that noon rather more solidly than usual, and when he came down he missed the sealers' well-defined trail between Northeast point and Lukannon, and brought up on the shore of that little round lake, just southwest of the point. He actually passed the whole of the remaining daylight, six or seven hours, in walking around it, and declared that he would never have left this unconscious circular tramp had the fog, as is usual, not lifted just at late evening and given him better bearings. He never knew or suspected until then that he was walking in his own tracks. This is a true fog story.

Novostoshnah rookery.—"A place of recent growth," so named from the fact that in early times—1787-'90—Hutchinson's hill formed an island distinct and well-defined from St. Paul; the people then used to go from Vesolia Mista over to Northeast point in boats.

THE ST. GEORGE ROOKERIES.—There is nothing peculiar to the nomenclature of the St. George rookeries; they all bear English names around the village, while "*Zapadnie*" is named simply as it lies west therefrom, and "*Starry Ateel*" because it is near the site of an old settlement on the island.

FIRST ARRIVALS OF "HOLLUSCHICKIE" USUALLY APPEAR MAY 14TH-15TH.—The first "driving", for the season, of the "holluschickie" seldom takes place sooner than the 12th or 15th of May; then only small numbers are secured, usually on the Reef point at St. Paul, and at the Great Eastern rookery on St. George; they are driven thus early for food, though the skins are always carefully taken and accepted by the company; the sealing season opens lawfully by the 1st of June and closes on the 15th of August. But in practice it does not begin until the 12th-14th of June and ends by the 20th-25th of July.

ANNUAL CROAKING BY THE SEALERS.—I noticed in this connection a very queer similarity between the sealers on St. Paul and our farmers at home; they, just as the season opens, invariably prophesy a bad year for seals and a

scant supply; then when the season closes they will gravely tell you that there never were so many seals on the island before! I was greeted in this manner by the agents of the company and the government in 1872, again in 1873, and again in 1874. I did not get up to the grounds in 1876 soon enough to hear the usual spring croaking of disaster; but arrived, however, in time to hear the regular cry of "never was so many seals here before!"

40. FINAL NOTES AND TABLES RELATIVE TO THE VALUE, PROTECTION, AND GROWTH OF THE FUR-SEAL; AND THE REVENUE DERIVED FROM THAT INDUSTRY ON THE PRIBYLOV ISLANDS.

AN EXHIBIT OF VALUES GIVEN BY VENIAMINOV.—Pt. i: *Zapieskie*, etc., p. 83, showing the relative importance, commercially, of the land and marine furs taken from the Oonalashka district (and sold) in 1833, by the Russian American Company. (This district embraces the Pribylov islands.)

Sort of fur.	Number of skins.	Price per skin.	Sum of value.	Reduced to our currency.	Remarks by the author, H. W. E.
Sea-otters	100	450 paper rubles.	45,000	\$9,000	<i>Enhydra marina</i> .
Black foxes	300	150 paper rubles.	45,000	9,000	<i>Vulpes fulvus</i> var. <i>argentatus</i> .
Cross foxes	600	25 paper rubles.	15,000	3,000	<i>Vulpes fulvus</i> var. <i>decussatus</i> .
Red foxes	500	10 paper rubles.	5,000	1,000	<i>Vulpes fulvus</i> .
Blue foxes	1,500	10 paper rubles.	15,000	3,000	<i>Vulpes lagopus</i> .
Land-otters	80	50 paper rubles.	4,000	800	<i>Lutra canadensis</i> .
Fur-seals	15,000	50 paper rubles.	750,000	150,000	<i>Callorhinus ursinus</i> .
Walrus-ivory	100 pods.	80 paper rubles.	8,000	1,600	A "pod" is 36½ pounds avoirdupois.
Whalebone	200 pods.	40 paper rubles.	8,000	1,600	The baleen from the right whale, <i>Balaena</i> .
Miscellaneous furs			1,000	200	Deer and sea-lion skins, odds and ends, etc.
Sum total			890,000	\$179,200	

The country (Alaska) is divided up into 5 districts: Sitka, Kadiak, Oonalashka, Atka, and the North.

This whole country is under the control and government of the "Russian-American Company". * * * The business is conducted with a head, or a colonial governor, assisted by officers of the Imperial navy (Russian), and those of the company's fleet, and other chiefs; in every one of the districts the company has an office, which is under the direction of an office chief (or agent), and he in turn has foremen (or "bidarsheeks").

The company on the island of St. Paul killed from 60,000 to 80,000 fur-seals per annum, but in the last time (1833?), with all possible care in getting them, they took only 12,000. On the island of St. George, instead of getting 40,000 or 35,000, only 1,300 were killed. * * * [Veniaminov: *Zapieskie*, etc., pt. i: chap. xii, 1840.]

The table and extracts which I quote above give me the only direct Russian testimony as to the value of the Pribylov fur-seal catch when the skins were in scant supply. It will be seen that they were worth then just \$10 each.

I now append a brief but significant extract from Techmainov—significant simply because it demonstrates that all Russian testimony, other than Veniaminov's, is utterly self-contradictory in regard to the number of seals taken from the Pribylov islands. Techmainov first gives a series of tables which he declares are a true transcript and exhibit of the skins sold out of Alaska by the Russian-American Company. The latest table presented, and up to the date of his writing, 1862, shows that 372,894 fur-seal skins were taken from the Pribylov islands, via Sitka, to the Russian markets of the world, in the years 1842-1862, inclusive; or giving an average catch of 18,644 per annum. (p. 221.) Then further on as he writes (nearly one hundred pages), he stultifies his record above quoted by using the language and figures as follows:

"In earlier times more were taken than in the later; at present (1862) there are taken from the island of St. Paul 70,000 annually without diminishing the number for future killing; on St. George, 6,000. * * * From 1842 to 1861 there were taken from the island of St. Paul 277,778 seal skins; blue foxes, 10,508; walrus teeth, 104 pods; from St. George, 31,923 fur-seals; blue foxes, 24,286." [P. Techmainov: *Eestorecheskoi Obozrenia Obrazovania*, Russian-American Company; pt. ii, p. 310, 1863, St. Petersburg.] Further comment is unnecessary upon this authority, who thus writes a "history of the doings of the Russian-American Company". Still, since Veniaminov's time, 1838-40, it is the only *prima facie* testimony that we have touching these subjects while under Russian domination.

RUSSIAN GOVERNORS CONTROLLING THE PRIBYLOV ISLANDS.—The following list gives the names of the several autocratic governors of the Russian-American Company, who, in their order of mention, exercised absolute control over the the Pribylov islands between 1799 and 1867, inclusive; 1, Baranov; 2, Yalnovskie; 3, Moorayev; 4, Chestyahkov; 5, Wrangell; 6, Kooprianov; 7, Etholine; 8, Tebenkov; 9, Rossenbarg; 10, Viaviatskie; 11, Forogel; 12, Maksutov. Of the above, with the exception of Baranov, who was a self-made man, and General Viaviatskie, of the Russian army, all the others were admirals and captains in the Imperial navy of Russia.

FIRST EXEMPTION OF FEMALES IN DRIVING.—In the details of an old letter from a Creole agent of the Russian-American Company, on St. Paul, in 1847, I find the following side reference to the number of skins which were shipped from the Pribylov islands that season: [Ms. letter of Kazean Shiesneekov, St. Paul island, 1817.]

5,606 "holluschikov" (young males).

1,894 "sairies" (four and five year-old males), or a total of 7,497.

This is interesting because it is the record of the first killing on the seal-islands when the females were entirely exempted from slaughter.

THE SEAL-ISLANDS WERE THE EXCHEQUER OF THE RUSSIAN-AMERICAN COMPANY: 1799-1825.—“The Russians in their colonial possession under Baranov, made, first, the seal-skin the basis of all transactions with foreigners, by buying up whole cargoes of goods and provisions brought into this country by English and American traders, and paying for the same in this way. In other words, the seal-islands were the exchequer where the Russian authorities could with certainty turn and lay their hands upon the necessary currency. These American, English, and other foreign sea-captains, having disposed of their supplies at Sitka or Kadiak in this manner, took their fur-seal skins to China and disposed of them at a handsome advance for tea, rice, etc., in exchange. The profits made by these foreigners having reached the ears of the Russian home management of the fur company controlling Alaska, it was ordered then that payments in fur-seal skins for these foreign supplies should cease, and that the Russians themselves would ship their skins to China and enjoy the emolument thereof. The result of this action was that the Chinese market did not prove as valuable to them as it was to the foreigners; it became overstocked, and a general stagnation and depression of the seal-business took place and continued until a change of base, in this respect, was again made, and the skins of the fur-seal were shipped, together with the beaver, in bulk to the great Chinese depot of Kiachta, where the Russians exchanged these peltries for the desired supplies of tea; the trade thereof assuming such immense proportions that the record is made where, in a single year, the Russian Fur Company paid to their government the enormous duty upon importations of tea alone of 2,000,000 silver rubles, or \$1,500,000. This was the period in the history of the seal-islands when, for a second time, and within the writing of Veniaminov, the seal-life thereon was well nigh exterminated. The first decimation of these interests took place in the last decade of the eighteenth century and shortly after the discovery of the islands, when, it is stated, 2,000,000 skins of these animals were rotting on the ground at one time. Rezanov applied the correction very promptly in the first instance of threatened extermination of these valuable interests, and when the second epoch of decimation occurred in 1834 to 1836, Baron Wrangell, admirably seconded by Father Veniaminov, checked its consumption. These are instances of care and far-sightedness which are refreshing to contemplate.”—Ivan Petrov: *Rept. on Pop. and Resources of Alaska*; *Ex. Doc. No. 40, 46th Cong., 3d Sess.*, 1881.

IRREGULARITY OF THE APPEARANCE OF PELAGIC FUR-SEALS.—While investigating the subject of the actual numbers of fur-seals secured at sea, outside of the Pribylov islands, I learned from Captain Lewis (Hudson Bay Company's “Otter”) that these animals never appear from season to season along the northwest coast, in the same general aggregate. For illustration, he cited the fact that in 1872, “immense numbers of fur-seal pups and yearlings” were observed in the ocean off Vancouver's island and the entrance to Fuca straits, “but last year (1873) very few of them again were seen.” He thought that in the case of the unwonted abundance of fur-seals there during 1872, it was due to the fact “that these young seals must have lost their bearings, somewhat, in going north, and ran into the coast for a better point of departure.” He declared, also, that fur-seals had never, during his 30 year's service on the northwestern coast, been known to appear in such great numbers before, nor did any other Hudson Bay man know to the contrary. In 1872 he thought that “8,000 to 9,000 skins, chiefly pups and yearlings” would be a fair estimate of the entire quantity taken; for 1873 his figures showed only “600 or 700 skins—these were all older ones”.

RECENT ERRONEOUS STATEMENTS IN REGARD TO PELAGIC BIRTH OF FUR-SEALS.—Allen [in his *History of North American Pinnipeds*, pp. 772-773] quotes a writer, who declares that any statement that the fur-seal breeds alone on the Pribylov islands to the exclusion of all other grounds on the northwest coast of America and Alaska, is “preposterous to his mind”. This author claims to know by his “own personal observation” that the fur-seal does “have pups in open ocean off the entrance to Fuca straits”! On the contrary, I assert that it is a physical impossibility for the *Callorhinus* to bring forth its young alive in the water; the pup would sink like a stone instantly after birth, and the mother be wholly helpless to save it.

I should not heed this statement of Mr. Swan, reinforced by that of an old sailor, so gravely entered by Allen, were it not for his introduction on the following page (773) of an innocent statement of fact by Prof. D. S. Jordan, who by it is unfortunately made to appear in the light of sustaining the idle theory of pelagic birth. Jordan's simple announcement that he had seen a “live fur-seal pup [June 1, 1880] at Cape Flattery, taken from an old seal just killed, showing that the time of bringing them forth was just at hand”, is correct as far as it goes; but remember, that this pup had been alive in its mother's womb for three months prior to the day Jordan saw it; and, ten days or three weeks later at the longest, this parent, if undisturbed, would have naturally brought it forth in the fullness of time on either St. Paul or St. George, of the Pribylov group. She could have made the journey there in six or seven days easily from Fuca straits, if she had been pressed to do so by the expiration of her period of gestation.

Naturally enough, the careful naturalist, like Allen, no matter how able, will be deceived now and then in this manner, by untrustworthy statements made by those who are supposed to know by personal observation of what they affirm. Mr. Swan has passed nearly an average lifetime on the northwest coast, chiefly in the waters of Washington territory, and has rendered to natural science and to ethnology efficient and valuable service by his

labor in collecting, and his notes in regard to the Makah Indians of Cape Flattery; hence his erroneous statements above referred to (as to the fur-seal) had a *prima facie* weight with Allen, who, therefore, inserted them, and thus gave the romance an appearance of reality, which I cannot pass by in silence. The other, though hesitating, authority, Charles Bryant, is an old mariner, who has also been well situated by virtue of eight years' residence on St. Paul island; he ought to know better.

ORIGINAL SOURCE OF ERROR IN REGARD TO NUBILITY OF FEMALE FUR-SEALS.—*Veniaminov: Zapieskie, ob Oonashlenskaho Otdayle*: Veniaminov little dreamed, as he labored over his queer calculations in 1834, that the then depleted rookeries of the Pribylov islands would have yielded, from 1868 to date, an annual average of more than three times 32,000 fur-seal skins; which number he at that time deemed the maximum limit of their ultimate production, should his tabulated advice be carried out. Is it not exceedingly strange that he never thought, during all his cogitations over this problem, of the real vital principle—of letting the females entirely alone—of sparing them strictly? I think that the worthy Bishop would have done so, had he passed more time on the rookeries himself. I cannot find, however, who the Russian was that had the good judgment, first of all men, to inaugurate a perpetual “zapoooska” of the females on the Pribylov islands; it was done in 1847, for the first time, and has been rigidly followed ever since, giving the full expansion in 1857 to that extraordinary increase and beneficial result which we observe thereon to-day. I have been much amused in reading [Allen: *Hist. Pinnipeds*, p. 383] the argument of an old sailor, who had been stationed for eight years on these islands in charge of the United States Treasury interests. He claims to feel well assured that the female seals, when two years old, never land on the islands during that season of their age; remaining out at sea, and not coming to the Pribylov rookeries until their third year of growth! thus bearing their first young when four years old. I mention the fact, because it is not an original error of the aged treasury agent, but is evidently adopted from this account of Veniaminov, which was verbally translated and read to him in 1869, on St. Paul island, by one of the ex-agents of the Russian Company. The erroneous statement, however, is quoted in Allen: *Pinnipeds* (p. 383), with a grave preface by the author, that it is the result of eight years' study of the subject on the islands. Unfortunately, Veniaminov, himself, did not spend even eight consecutive weeks on the seal-grounds in question, and had he passed eight months there, investigating the matter, he would not—could not—have made this superficial blunder, in addition to his numerous other faulty announcements, etc., which the “*Zapieskie*” teems with, in regard to the seal-life.

CAUSES WHICH OCCASION AND DEMAND THE PRESENCE OF A REVENUE-MARINE CUTTER IN ALASKAN WATERS.—There remains an unwritten page in the history of the action of the government toward the protection of seal-life on the Pribylov islands, and it is eminently proper that it should be inscribed now, especially so since the author of this memoir was an eye-witness and an actor in the scene. When he first visited the seal-islands, in 1872-'73, he was compelled to take passage on the vessels of the company leasing the islands; compelled, because the government at that time had no means of reaching the field of action, except by the favor and the courtesy of the Alaska Commercial Company. This favor and this courtesy, as might be expected, was always promptly and generously proffered, and has never been alluded to as even an obligation or service rendered the Treasury Department. But, nevertheless, the thought occurred to me at the time, and was strengthened into conviction by 1874, that this indifference to its own self-respect and failure to support properly the aims of its agents up there, should end; and that the Treasury Department should detail one of its own vessels to visit, transport, and aid its officers on the Pribylov islands, and also be an actual living evidence of power to execute the law protecting and conserving the same.

In this sequence, do not misunderstand me; while the Alaska Commercial Company never entertained, and do not now entertain, the thought of refusing the favor asked by the government in transporting its own treasury officials to and from the seal-islands, yet, it would be a relief to that company if those agents aforesaid should be carried up and down upon the vessels of the government—a relief solely on the ground that a carping criticism is always made upon their courtesy and kindness in this respect, and a corresponding reflection thrown upon the treasury agents, who are compelled to take this method of conveyance, or else be absent from their field of duty, which the company does not propose to effect by barring them from its steamer, the aforesaid criticism notwithstanding.

Therefore, upon the occasion of my return from the field in question, October, 1874, I clearly recognized the immediate necessity of strengthening the arm of the government in that region, because, in addition to the foregoing reason, the following still more urgent one existed and exists:

Early in 1873 it became well known on the Pacific coast, that the officers of the law on the seal-islands had no means of enforcing the regulations protecting the seal-life on the same or in the waters adjacent; hence, a number of small craft, fitted out at San Francisco and contiguous ports, which cleared for the northwest coast and the Aleutian islands on “fishing ventures”; but, in reality, these vessels proceeded directly to the waters and rocks adjacent to the seal-islands, where, in plain sight of the villages on either islet, they shot the swimming seals with assumed indifference and great affection of legality!

In order, therefore, that this plain violation of law and its disastrous consequence should be effectually punished, and evaded, I published, and personally urged in 1874-'77, the urgent need and great propriety of enabling the responsible agents of the government on the Pribylov islands, to enforce the law as well physically as it could be

done theoretically; and pointed clearly then to the advantage and effect which a revenue marine cutter would have, employed for this purpose. By repeated and untiring appearance before the Committee on Appropriations in the House and the Senate, I finally secured the legal authority and the money for the object in view. And the late Captain Baily, in the "Richard Rush", made the first cruise in the season of 1877, that had been ordered and sustained by the government toward the direct protection of the seal-islands, and its valuable property thereon since 1869.

The interesting Alaskan reports, which have arisen from the incidental cruises of the "Rush" and the "Corwin", United States Revenue Marine, owe their origin to the above chain of circumstances, and this service, so efficient and so valuable, will, I trust, be faithfully sustained by the government in the future.

THE AUTHOR'S CLOSING PRESENTATION OF THE SUBJECT.—As I end this memoir, I am aware of one omission which should not be overlooked. It is the absence of a concise and condensed table, which shall exhibit at a glance the whole physical progress made by the fur-seal, from birth to advanced puberty. Therefore, I submit the following presentation of that subject:

Table showing the relative growth, weight, etc., of the fur-seals.

[Compiled from the field-notes of the author, made upon the killing-grounds of St. George and St. Paul.]

GROWTH. (A fair average example.)	1 day old.	6 months old.	1 year old.	2 years old.	3 years old.	4 years old.	5 years old.	6 years old.	7 years old.	8 years old.	Remarks.
<i>Callorhinus ursinus</i> (male).	Length. 12 to 13 in.	Length. 24 in.	Length. 38 in.	Length. 45 in.	Length. 53 in.	Length. 58 in.	Length. 65 in.	Length. 72 in.	Length. 75 to 80 in.	Length. Ceases.	Direct, from tip of nose to root of tail. Do.
<i>Callorhinus ursinus</i> (fem.).	12 to 13 in.	24 in.	37 in.	42½ in.	48 in.	50 in.	Ceases.	-----	-----	-----	
GIRTH. (Immediately behind fore-flippers.)											
<i>Callorhinus ursinus</i> (male).	Girth. 9 to 10½ in.	Girth. 25 in.	Girth. 25 in.	Girth. 30 in.	Girth. 36 in.	Girth. 42 in.	Girth. 52 in.	Girth. 64 in.	Girth. 70 to 80 in.	Girth. 80 to 84 in.	8 year old citation an estimate only.
<i>Callorhinus ursinus</i> (fem.).	9 to 10 in.	25 in.	25 in.	30 in.	34 in.	36 in.	37 in.	Ceases.	-----	-----	
WEIGHT (avoid dupes).											
<i>Callorhinus ursinus</i> (male).	Lbs. 5 to 7½	Lbs. 39	Lbs. 40	Lbs. 58	Lbs. 87	Lbs. 135	Lbs. 200	Lbs. 280 to 350	Lbs. 400 to 500	Lbs. 500 to 600	7 and 8 year estimates are not based upon actual weights; an opinion merely.
<i>Callorhinus ursinus</i> (fem.).	5 to 7	39	39	56	60	62	75	Ceases.	-----	-----	

NOTE.—All male fur-seals, from yearlings to puberty, are termed "bachelors", or "holluschickie", and all male fur-seals, from the age of five years on, are termed ("virile") bulls, or "seacatchie". All female fur-seals from one year and upward, are termed "cows", or "matkamie" ("mothers"). All the young, under yearlings, are termed "pups", or "kotickie" ("little cats").

In conclusion I desire to state that, as to the relative ages of the male and female *Callorhinus*, I have hitherto, in referring to it, taken the general ground of estimation which is commonly accepted in rating the duration of mammalian life. Nevertheless, on this point especially, I feel that if the real facts of the comparative longevity of the two sexes could be positively ascertained, the great discrepancy which the table above faithfully portrays and suggests, would be so modified as to make the relative length of life for the female much greater, and that of the male correspondingly less.

In my discussion of the reproduction of these animals, I clearly show that the male is physically qualified to procreate his race at the age of four years—but that he is not allowed to do so until he is six or seven. Also, that the female becomes a mother at the expiration of the third year of her life, and the immediate opening of the fourth. So, really, viewed from the point of sheer physical ability, if undisturbed, the male fur-seal wears the "toga virilis" at the close of the third and beginning of the fourth year of his life, while the female comes out eager for fecundation and prospective maternity at the end of the second and the beginning of the third summer of her existence.

TABULATED EXHIBIT OF METHOD OF KILLING, AND SEASONS OF THE YEAR IN WHICH IT IS DONE, ON THE PRIBYLOV ISLANDS.—In order that the reader may the more clearly understand the time of killing, the seasons in which it is done, and the relative selection of the different classes of seals for slaughter, food, etc., I take much satisfaction in being able to submit the following tabulation, which gives at a glance a succinct and comprehensive epitomé of one entire sealing-season and its work on the Pribylov islands. This table is literally brought down to date, and the figures upon which it is based I have taken from the recent official report of Col. H. G. Otis, who is the treasury agent in charge of the interests of the government therein represented. I ought, also, in simple justice to the authority from whom I have taken these enumerations, to state that those specifications of fact are evidently compiled from his field-notes with scrupulous attention, both in their original registration, and also in their transcription. As I here arrange them, they present a photograph of the entire disposition of 107,000 fur-seals slain upon the seal-islands during one whole year.

Table showing the numbers slain, the time of so doing, the character, and the disposition made of the fur-seal on the Pribylov group for one year ending July 20, 1881.

Months; time of slaughter.	Number of fur-seals killed for natives' food.				Holluschickie killed for their skins.					Grand sum total		Remarks.	
	Holluschickie.	Pups.	Rejected skins.			Prime.	Second rate.	Rejected skins.			Skins accepted by Alaska Com'l Co.		Whole number of fur-seals slain.
			Under size.	Stagy.	Cut.			Under size.	Cut.	Other reasons.			
SAINT PAUL ISLAND.													
Balance left over from "1880 count"						228					228		Generally, a few skins left behind every season.
July (20th to 31st), 1880	261		5	233	13						10	261	Two year old males and a few yearlings, principally.
August, 1880	622										371	622	Two and three year old males generally.
September, 1880	661			661								661	Two year old males chiefly.
October, 1880	453	10	10	393							60	463	Two and three year old males principally.
November, 1880	540	4,400	4,401	54	5						480	4,940	Pups killed by express permission of the Secretary of the Treasury.
December, 1880	1,248	3	14		36						1,201	1,251	Very fine skins; remaining latest on the islands.
January, 1881	1,058		4		13						1,041	1,058	Do. Do.
May, 1881	176		5								171	176	Very fine skins; first arrivals, two and three year old males.
June, 1881						34,836	294	11	10	3	35,130	35,160	Very fine skins; two and three year old males chiefly.
July (1st to 20th), 1881						40,969	339	14	23		41,368	41,345	Do. Do.
Total	5,019	4,413	4,439	1,341	67	76,033	633	25	39	3	80,000	85,937	
SAINT GEORGE ISLAND.													
Balance left over from "1880 count"						25					25		A few skins always left behind—not properly cured.
July (20th to 31st), 1880	147										147	147	Two year old males, principally.
August, 1880	277		11								266	277	Two and three year old males, usually.
September, 1880	122			64							58	122	Do. Do.
October, 1880	63	500	500	62							1	563	Pups killed by express permission of the Secretary of the Treasury.
November, 1880	10	795	795								10	805	Do. Do.
December, 1880	46	35	35								46	81	Two and three year old males; fine skins.
May, 1881	87										87	87	Two and three year old males; first arrivals of the new sealing year.
June, 1881						8,133		1	31	1	8,133	8,166	Very fine skins; two and three year old males chiefly.
July (1st to 20th), 1881						11,227			25	5	11,227	11,237	Do. Do.
Total	752	1,330	1,341	126		19,385		1	56	6	20,000	21,505	
Pribylov catch for 1880 (St. Paul and St. George islands):													
Grand sum total	5,771	5,743	5,780	1,467	67	95,418	633	26	95	9	100,000	107,442	

EXPLANATORY COMMENTS UPON THE ABOVE TABLE.—It will be at once noticed that, in the result of this last season's work on the Pribylov islands, as illustrated so clearly above, the Alaska Commercial Company has taken its full annual legal quota of 100,000 fur-seal skins therefrom. I call attention to it, because it is the first season in which the company has done so; it has never heretofore permitted more than 99,800, in round numbers, to be taken and charged to its account, preferring to always be a little within the mark, on account of the exceeding difficulty of reconciling the enumeration of the two sets of government officers, when their counts are placed side by side. For instance, the list of the treasury agent on the islands, when the skins are first shipped, is the official indorsement of the company's catch for the year; but when the ship reaches San Francisco, then these skins are all counted over anew by another staff of government agents. Should the tally of the seal-island agent be defective, and show that it was so by the recount of the custom-house officers in San Francisco, then did it run over 100,000 skins, the company would have an annoying and unpleasant explanation to make; while the resident treasury agent would be charged with maladministration of his affairs. Therefore, as it has never happened before, until this season of 1881, that the two counts at San Francisco and St. Paul have agreed to a unit, the company has given strict and imperative orders that no more than 99,800 or 99,850 skins shall be annually taken by its agents from the seal-islands. Taking the full quota of this season of 1881, was contrary to its express direction.

It is an exceedingly difficult matter to count these skins, precisely to a dot, when they are rapidly hustled into the baidars and then tossed below the decks of the rolling, pitching ship which receives them; a rough sea may be running, a gale of wind howling through the rigging, and a thick fog shrouding all in its wet gloom. I believe, therefore, from my own full experience in this important matter, that it is a physical impossibility, at many seasons of shipment, to tally accurately *every* pelt as it enters the vessel's hold, when loaded off the islands here. The Treasury agent who comes within 100 to 150 skins, more or less, of the true 100,000, or in that ratio to the whole catch, as it may be, is doing all that he possibly can under the circumstances. Naturally, the custom-house tally is considered the most accurate, by reason of the great physical advantages attendant; and, upon its certification the company pays the tax levied by law.

USELESS SLAUGHTER OF THE PUPS.—The observer will also notice, that during the last season, viz, July 20, 1880, to July 20, 1881, as shadowed in the foregoing table, more than 7,000 seals were killed for food, the skins of which were simply wasted—never used; and of that aggregate we find nearly 6,000, or about nine-tenths of the entire loss, to be “pups”. At this point, and in this connection, I desire to enter my protest against the useless and wholly uncalled-for slaughter of these pups, which is annually permitted and inadvertently ordered, with the best of spirit, by the Secretary of the Treasury. It is a shiftless legacy of the old Russian Company, which the present admirable conduct of business on the Pribylov islands really renders superfluous and wasteful; it is simply catering to a gastronomic weakness of the Aleuts, that should not be considered, inasmuch as the supply and the flesh of the two and three year-old males is fully good enough; and most of the skins taken from such animals late in October and thereon to the end of the year, will be accepted as prime by the company, and counted in the regular annual quota for exportation. I have in this matter, however, been quite as much at fault as the Secretary himself; more so, because I have not hitherto directed attention to it; it escaped my mind in 1874, and I have not had occasion to recall it until the present writing.

THE SEASON OF 1881 A VERY CREDITABLE ONE.—The exhibit given above, of the work performed in the height of the sealing season, June and July, is a better one, even, than any one which has passed prior to it under my supervision. In other words, the number of cut or rejected skins is almost infinitesimal compared with the huge aggregate accepted; and, were it not for the wasted pup skins, this presentation of the field-labor on the seal-islands for 1881, would be a very clean and economic synopsis.*

The thought also occurred to me, when regarding this special point of the relative improvement in the method of killing and handling seals and pelts, that a very simple yet trustworthy notice, as to the increase or diminution of the seal-life, would be served annually in the following manner: in 1872, I observed that the natives never had any difficulty in getting their full quota of “holluschickie” daily, during the prime season of taking skins; again, in 1873, I saw that, if anything, the number of “holluschickie” required was easier to obtain than in 1872, prior; still again, throughout the killing-season of 1874, the constant remark of all concerned, at St. Paul, was that the prime seals were never so abundant before; and, finally, in 1876, I heard, from these same parties interested, that it had been the most auspicious season, throughout, ever known to St. Paul island.

Thus, it may naturally be inferred, that this steady and rather increased supply of “holluschickie” from year to year, means nothing, unless it points to a relative annual augmentation of the seal-life on the Pribylov islands; and it really acts in this wise as a life-barometer, that is sensibly affected by the heavier or lighter pressure of the rookeries operating upon it.

Hence, the foregoing table, brought down as it is, to date, shows that the chosen seals are in abundant supply; that the work was remarkably expeditious; that the natives scarcely wasted a skin by cutting on the killing-grounds; and, all in all, it represents a highly creditable state of affairs, suggestive of the steady condition of prosperity and security, which I unhesitatingly prophesied in 1873, after giving the matter much study and reflection.

A PRESENTATION OF THE REVENUE DERIVED FROM THE PRIBYLOV ISLANDS.—The following transcript from the books of the Treasury Department, shows the exact receipts which the public coffers have derived as revenues from the seal-industry on the Pribylov islands, between the date of the act leasing them, July 1, 1870, up to August 20, 1881. I may say, without the least exaggeration, that these interests never yielded a tithe of this substantial aid and support to the government of Russia, and they would not have returned a single cent, net, to the Treasury of the United States, had they not been so wisely and promptly protected by the good sense of our Congress in 1870. They would have passed in a few short seasons beyond all knowledge of men, as far as their appearance on the great breeding rookeries of St. Paul and St. George was concerned.

*The report of Colonel Otis, special agent Treasury Department, in charge of the seal-islands, for 1880, contains an interesting table, which covers a period of eleven years, viz, 1869-1880, inclusive; and it shows, first, the number of seal-skins taken in each sealing season proper on St. Paul island; second, the number of days expended in the work per annum; third, the number of sealers engaged; fourth, the average number of skins taken per day; and fifth, the average daily credit of skins taken for each man. The deduction which that gentleman makes from this suggestive and instructive codification, is that the seals seem to sensibly increase from year to year, rather than to diminish in numbers.

TAX AND RENTAL PAID INTO THE TREASURY OF THE UNITED STATES BY THE ALASKA COMMERCIAL COMPANY—
THE LESSEE OF THE PRIBYLOV ISLANDS—1870-'81.*Tax on seal-skins taken by the Alaska Commercial Company, per act of July 1, 1870.*

No. 422, 4th quarter, 1870	\$86,167 00	
No. 376, 1st quarter, 1871	5,862 00	
No. 1215, 2d quarter, 1871	9,051 00	
		\$101,080 00
No. 753, 4th quarter, 1871	159,545 63	
No. 1255, 2d quarter, 1872	102,807 00	
		262,352 63
No. 596, 4th quarter, 1872		252,181 12
No. 1466, 3d quarter, 1873	108,066 00	
No. 1467, 3d quarter, 1873	150,648 75	
No. 1001, 4th quarter, 1873	13,366 50	
		272,081 25
No. 1533, 3d quarter, 1874	261,822 75	
No. 1534, 3d quarter, 1874	672 00	
		262,494 75
No. 445, 3d quarter, 1875	10,106 25	
No. 1515, 3d quarter, 1875	147,598 50	
No. 433, 4th quarter, 1875	104,879 25	
		262,584 00
No. 1089, 3d quarter, 1876	172,063 50	
No. 433, 1st quarter, 1877	64,092 00	
		236,155 50
No. 1527, 3d quarter, 1877		198,255 75
No. 1659, 3d quarter, 1878	36,965 25	
No. 1660, 3d quarter, 1878	200,895 00	
No. 1581, 4th quarter, 1878	15,587 25	
		262,447 50
No. 1088, 3d quarter, 1879	223,125 00	
No. 1686, 4th quarter, 1879	39,275 25	
		262,400 25
3d quarter, 1880		262,500 00
1881		262,395 00
Total tax paid up to date, August 20, 1881		2,896,927 75
Plus the annual rental of \$55,000, from 1871-1880, inclusive, plus \$5,480 75 rental for short lease of 1870—rental paid		555,480 75
Grand sum total of tax and rental		3,452,408 50

GLOSSARY.

41. DEFINITION OF TECHNICAL TERMS AND RUSSIAN NOMENCLATURE, USED BY THE AUTHOR IN THE PRECEDING MONOGRAPH.

- AILUCKEYAK** (Aleutian).—A rough back-bone.
ALEUT (Russian).—Name given to all native inhabitants of the Aleutian islands.
ARRIE (Russian).—*Lomvia arra*. The guillemot, or murre; so named from the bird's harsh cry of "arra-arra".
BAILLIE BRÜSHKIE (Russian).—*Phaleris psittacula*. Parroquet Auk; "white bosom".
BANIO (Russian).—A steamy bath-house.
BARBIE (Russian).—An elderly married woman.
BARRABKIE (Russian).—A hut.
BARRABARA (Russian).—A large hut, or "kozarmie".
BAROON (Russian).—Surf.
BIDARRAI (Russian).—A large skin-covered boat, propelled with oars, or used with sails before the wind; carries from three to ten tons.
BIDARKA (Russian).—A small skin-covered canoe.
BIDARSHIK (Russian).—One who controls a baidar and its crew; a foreman.
BOBROVIA (Russian).—Otter island.
BOGA SLOV (Russian).—God's word.
BOORGA (Russian).—Gale that blows fiercely and is laden with snow; from "booryah", a storm or tempest.
BOLSHOI (Russian).—Big.
BUK (Russian).—A working ox, or bull.
BULL (English).—The adult male fur-seal; also the adult male walrus and sea-lion.
CANOOSKIE (Russian).—*Simorhynchus cristatellus*. Crested auk.
CHIKIE (Russian).—*Larus glaucus*. Burgomaster gull.
CHOENIE GOOSE (Russian).—*Branta canadensis* var. *leucoparvia*. White-collared goose.
CHOOCHKIE (Russian).—*Simorhynchus pusillus*. Least, or knob-billed auk.
CHOOCHIL (Russian).—To Stuff.
COOKINET (Russian).—The Aleutian cooking hut outside of the barrabkie.
COW (English).—The adult female of the fur-seal, the sea-lion, and the walrus.
DALNOI MEES (Russian).—Distant cape.
DEETIAH (Russian).—Children.
DOMASHNIE (Russian).—Houses.
EINAHNUITO (Aleutian).—The mammæ.
EMANNIMIK (Russian).—Namesday; or, literally, used as birthday.
EPATKA (Russian).—*Fratercula corniculata*. Horned puffin.
FLENSING (English).—Act of removing skins from seal carcasses.
FLIPPER (English).—The fore-hand and hind-foot of fur-seal, sea-lion, and walrus.
GORBOTCH (Russian).—Humpback.
GORODE (Russian).—A town; a village.
GOVEROOSKIE (Russian).—*Larus brevirostris*, and *L. tridactylus*. Gulls.
HAULING (English).—Action of seals in coming up from the sea over the land.
HEAT, "HEATING" (English).—That sudden decay of the seal's body after death.
HOLLUSCHAK, pl. **HOLLUSCHICKIE** (Russian).—Bachelor; bachelors.

- HUMPBAC WHALE (English).—*Megaptera versabilis*.
 KALOG (Aleutian).—All the small cottoid fishes.
 KAMLAUKA (Russian).—The water-proof shirt.
 KAMMIN (Russian).—Stone.
 KAMMINISTA (Russian).—Rocky place.
 KANOOSKA (Russian).—See Canoskie, *antea*. "Little captain."
 KAPOOSTAH (Russian).—All algæ. Sea-weeds; from "morskie kapoosta", a "sea-cabbage".
 KAUTICK, pl. KAUTICKIE (Russian).—Fur-seal, collectively.
 KEETAVIE (Russian).—Whale place.
 KENCH (English).—Bin in the salt-house for pickling fur-seal skins.
 KESHLA (Russian).—Sour; rotting.
 KIBITSCHA (Russian).—The common four-wheeled carriage of Russia.
 KILLER-WHALE (English).—*Orca gladiator*, var. *rectipinnis*.
 KOLITSKIE (Russian).—*Tringa ptilocnemis*, and all waders on the islands.
 KOTICK, pl. KOTICKIE (Russian).—Young fur-seal.
 KVASS, or QUASS (Russian).—Native home-brewed beer; vile product of flour, dried apples, sugar, and water, fermented in a cask for a certain period; also called "mahkoolah", after a Russian brewer.
 LAABAS (Russian).—Drying or hanging frame for meat and fish.
 LAAPKA (Russian).—Storehouse, or store.
 LAASBUSTCHIE (Russian).—Breeding-grounds (literally, "a place where seals dry off").
 LIMMERSHIN (Aleutian).—*Anorthura troglodytes*; wren. (A "chew of tobacco").
 LOUGHTAK (Russian).—Air dried skins of all seals.
 LUPUS (Russian).—*Fulmarus glacialis*, var. *Rodgersi*. Fulmar. A large species of petrel.
 MAASLUCKEN (Aleutian).—Missing, or minus.
 MATKA (Russian).—Mother; applied to female fur-seals and sea-lions.
 MEDVAIDSKI (Russian).—Bears.
 MELCHISKA (Russian).—Boy; urchin.
 MEES (Russian).—Cape; headland; point.
 MISTA (Russian).—Place; spot.
 MOROSHA (Russian).—The fruit of *Rubus chamæmorus*. "Little frost berry."
 MORSEZOVIA (Russian).—Walrus island; also, "Morserovia".
 MORSKIE KOT (Russian).—Fur-seals ("sea-cat").
 NAHVOSTOKE (Russian).—"To the eastward"; applied to the Black Bluffs on St. Paul.
 NAHSAYVERNIA (Russian).—"To or on the north shore."
 NAH SPEEL (Russian).—"On the point"; a corruption of "nah speetsah".
 NEARHPAH (Russian).—*Phoca vitulina*. The hair-seal.
 NOVASTOSHNAH (Russian).—"Place of recent growth"; applied to Northeast point.
 OCHEN (Russian).—Very.
 OOTKIE (Russian).—Duck; applied to all ducks.
 OREEL (Russian).—*Graculus bicristatus*. Shag, cormorant.
 OSTROV (Russian).—Island.
 PAHKNOOT (Russian).—A smell.
 PAHTOSHKIE (Russian).—*Leucosticte tephrocotis* var. *griseinucha*. Gray-eared finch.
 PEESAICH, pl. PEESTCHEE (Russian).—*Vulpes lagopus*. Blue and white foxes.
 POD (English).—A smaller or larger gathering of seals on land.
 POLAVINA SOPKA (Russian).—Halfway mountain.
 POLTOOS (Russian).—*Hippoglossus vulgaris*. Halibut.
 POMEERAT (Russian).—To die; applied only to the decease of animals.
 PRECASHCHIK (Russian).—An agent; a clerk; a sheriff.
 PREDOVCHIK (Russian).—The "senior officer".
 PROMYSHLENIK (Russian).—A hunter.
 POVARNIK (Russian).—A cook-room.
 PUP (English).—The young of the fur-seal and sea-lion, up to the age of one year.
 RAAK (Russian).—The common crab. (*Chionoecetes*.)
 RAHKOOSHA (Russian).—The common mussel. (*Mytilus*.)
 RAP-O-LOOF (Russian).—*Turdus migratorius*. Red-breasted Robin.
 RAZBOINEK (Russian).—Robber.
 REPKIE (Russian).—*Echinoidæ*. Sea-urchins.
 ROOKERY, pl. ROOKERIES (English).—Breeding-grounds and breeding-seals thereon.

- SAAFKÁ (Russian).—*Harelda glacialis*. "Old squaw," long-tailed duck.
 SCOOCNIE (Russian).—Tiresome; lonesome.
 SEECATCH, pl. SEECATCHIE (Russian).—Male fur-seal and sea-lion, full grown.
 SEEVITCH, pl. SEEVITCHIE (Russian).—Sea-lion, collectively.
 SEROVNAH (Russian).—"Just like it."
 SIEKSAN (Russian).—*Empetrum nigrum*. Vine and fruit thereof. The "crowberry" of English botanists.
 SNAGUISKIE (Russian).—*Plectrophanes nivalis*. The snow bird.
 STAROOKA (Russian).—An old woman.
 STAREEK (Russian).—An old man.
 STÖORMAN (Russian).—Ship's mate.
 TALNEEK (Russian).—*Salix*. All the creeping willows are thus named.
 TARBOSSA (Russian).—Native boots made of the flippers, throats, and intestines of the *Pinnipedia*.
 TAWPORKIE (Russian).—*Fratercula cirrhata*. Tufted puffin; from its hatchet-like bill.
 TAYOPLI (Russian).—Warm.
 TOLSTOI (Russian).—Thick.
 TONKIE MEES (Russian).—Little or peaked cape.
 TREESCA (Russian).—*Gadus morrhua*. Codfish.
 UN KONCHIELSAN (Russian).—"He has finished." The refined reference to human death; never applied to animals.
 VARRONE (Russian).—*Corvus corax*. Raven.
 VESOLIA MISTA (Russian).—Jolly place.
 WHALE RIND (English).—The skin of the whale.
 WIG (English).—That light buff-colored patch on the shoulders of the seecatchie.
 ZAPOOSKA (Russian).—A saving of, or sparing of.
 ZOOBÄDEN (Russian).—"Tooth cut; tooth bitten."

42. WEIGHTS, MEASURES, AND VALUES.

I introduce the following brief tables of Russian weights, measures, and values, in order that the occasional mention made by Veniaminov, in this respect, may be clearly understood, and also to assist any inquiring individual who may be disposed to read up Russian authorities on the subject of their travel, geographical research, and fur-trade in Alaska.

WEIGHTS.

1 zolotnik =	6	English grains av.
3 zolotnik =	1	"Lot".
32 "lots" =	1	English pound av.
1 pood =	$36\frac{1}{16}$	English pounds av.

MEASURES.

1 arsheen =	28	English inches.
1 vershoak =	$1\frac{1}{2}$	English inches.
1 sajeen =	7	English feet.
3 versts =	2	English miles.

MONEY.

1 copper kopeck =	1	silver kopeck.
2 copper kopecks =	1	grösh.
3 copper kopecks =	1	alteen.
5 copper kopecks =	1	peetack.
5 silver kopecks =	1	peetack.
10 silver kopecks =	1	greenvah.
15 silver kopecks =	1	petealtin.
20 silver kopecks =	1	dvoogreevenik.
25 silver kopecks =	1	chetvertak.
50 silver kopecks =	1	polteenah.
100 silver kopecks =	1	ruble.*

The gold coinage of Russia is seldom seen, even at home, and never has been used in Alaska; the form of its coinage is known to Russians as an "Impériale", and is equal to about \$5 of our currency.

The word "ruble", according to Mr. S. N. Büynitskie, comes from the Russian "roobee", or, to hew with a hatchet, because the practice of notching the bullion bars, as specified below, was one that called for the use of a little ax for that purpose. In 1654 rubles were first introduced to Russia, at Moscow, in the form of bullion bars, with deep notches in them, "*rubli*", which enabled the possessor to detach as much of the bar as his payment might require; hence the origin of the word *ruble*; the first silver money of Russia was coined at Novogorod in 1420; it was struck in small pieces, which were then, as now, called "*kopecks*"; the present value of the kopeck is not quite $\frac{3}{4}$ of 1 cent (United States currency). Nearly all the ordinary business calculations of Russia are made upon the basis of kopecks. At present, specie has substantially disappeared in that country, and depreciated paper is

*The silver ruble is nearly equal to 75 cents in our coin. The paper ruble fluctuates in Russia from 40 to 50 cents, specie value; in Alaska, it was rated at 20 cents, silver. Much of the "paper" currency in Alaska during Russian rule was stamped on little squares of walrus hide.

the representative; the silver kopeck no longer exists as current coin. The copper kopeck bears on its obverse side the figure of St. George spearing a dragon: "from this spear," says Georgi, "called *kapeca* in Russian, the term *kopeck* has been derived."

A still smaller coin, called the "*polooshka*", worth $\frac{1}{4}$ kopeck, has been used in Russia; it takes its name from a hare skin, "*ooshka*", or "little ears", which, before the use of money by the Slavs, was one of the lowest articles of exchange; *pol* signifying *half*, and *polooshka*, *half a hare's skin*. From another small coin, the "*deinga*" (equal to $\frac{1}{2}$ kopeck in value), is derived the Russian word for money, *deingah* or *deingie*.*

In conclusion, it may be interesting to add to this mention of the coin used on the seal-islands and in the fur-trade transactions of Alaska, that the first piece of stamped money known to the numismatic records is a small coin made by the Phocians about 700 B. C., on the obverse side of which was the figure of a seal, so stamped because when these people were emigrating their boats were "followed by shoals of seals".

* As far as I can ascertain, the above expression of Russian nomenclature, regarding the subjects named, is the first correct rendition made in the English language of the same. Clarke [*Travels*: 1800] gives, on a fly-leaf of introduction to his interesting and graphic picture of Russian life and country, these items of weight, measure, and money, nearly all correct as to figures, but hardly one of the Muscovitic equivalents is properly pronounced and spelled in accordance. He frankly confesses his ignorance, however, of the Russian language, and hence bars out all adverse criticism thereby. I should also add that I have, as far as possible, refrained from using any of the Aleutian nomenclature on the seal-islands, for the simple reason that while these natives do not, in talking among themselves, employ the above Russian titles, yet when they address us they do, and hence the Slavonian designations are those which all races up there agree upon in their definition and application.

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